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ACCOUNTS AND PAPERS:

TWENTY-NINE VOLUMES.

—(5.)—

ARMY.

MILITARY EDUCATION.

Session

7 *February* —— 6 *July* 1865.

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ACCOUNTS AND PAPERS:

1865.

TWENTY-NINE VOLUMES:—CONTENTS OF THE

FIFTH VOLUME.

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ARMY:

Military Education:

[3422.] Second Report by the Council of Military Education on Army Schools, Libraries, and Recreation Rooms - - - p. 1

[3502.] Second General Report by the Council of Military Education 305

SECOND REPORT

BY THE

COUNCIL OF MILITARY EDUCATION

ON

ARMY SCHOOLS, LIBRARIES, AND RECREATION ROOMS.

Presented to both Houses of Parliament by Command of Her Majesty.

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CONTENTS.

	Page
I. Introduction	iii
II. Schoolmasters	iv
III. Schoolmistresses	vi
IV. Inspection of Schools	vii
V. System of Inspection	viii
VI. State of Education in the Army	ix
VII. „ „ in the Schools	x
VIII. Attendance of Adults at School	xii
IX. Certificates	xiv
X. Course of Instruction	xv
XI. Special Classes	xvi
XII. Children's Schools	xix
XIII. Religious Instruction	xxiv
XIV. Royal Military Asylum	xxv
XV. Royal Hibernian Military School	xxx
XVI. Lectures	xxxii
XVII. Garrison Libraries	xxxiv
XVIII. Regimental Recreation Rooms	xxxvi

SECOND REPORT

BY THE

COUNCIL OF MILITARY EDUCATION

ON

ARMY SCHOOLS, LIBRARIES, AND RECREATION ROOMS.

I.

The Council of Military Education have the honour to submit to His Royal Highness the Field Marshal Commanding-in-Chief and to the Secretary of State for War their Second Report on Army Schools, Libraries, and Recreation Rooms.

The First Report of the Council on Army Schools was made in December 1861. At that period a number of interesting and valuable reports, called for by the Secretary of State for War, had been received from the Assistant and the Local Inspectors, as well as from some of the more experienced Schoolmasters, on the effect of various changes that had been made in the management of Regimental Schools since the system was first brought into operation. These documents were printed in the Appendix to the First Report, but the Council's Minute upon the same subject, dated 31st July 1861, being under consideration of Government, could not then be published. It will now be found in the Appendix of the present Report, (page 1). During 1862 and part of 1863, the Council were in frequent communication with the Field Marshal Commanding-in-Chief and the Secretary of State for War, regarding projected changes of great importance in the organization of the Army School Department. These changes received the final sanction of Government and were promulgated in War Office Circular No. 821 of 25th May 1863.

II.

Schoolmasters.

By the Regulations of 25th May 1863 the classes under which Schoolmasters of the Army are arranged are reduced from four to two, viz. :—

Superintending Schoolmasters, being commissioned officers with the relative rank of Ensign, and

Army Schoolmasters, taking rank as non-commissioned officers next below regimental serjeant-majors.

This arrangement was to apply to all who should become schoolmasters after the date above mentioned; schoolmasters already in the service being allowed the option of adhering to the old system or of accepting the new regulations in this respect.

Superintending Schoolmasters are selected by merit alone from the whole body of schoolmasters.

Under authority of War Office letter 50/Gl. No./450 of 18th November 1862, the establishment of superintending schoolmasters consists of 18. The Council have considered that great care should be taken in a matter so intimately affecting both the personal interests of a large and deserving body of men and the welfare of the schools. They therefore limited themselves to recommending, for the commissioned rank in 1863, four first-class schoolmasters, who had performed valuable services in large camps or stations, and, in the present year, they have recommended three additional first-class schoolmasters, who had given great satisfaction in the charge of large and important schools.

The 31st March 1864 having been appointed as the latest date at which schoolmasters were to elect between the old and the new regulations as regards promotion, 128 elected to come under the new, and the establishment at the above date stood thus—

Under the New Regulations as to Promotion.

Superintending Schoolmasters - -	7*
Army Schoolmasters - - -	128

Under the Old Regulations.

1st Class Schoolmasters - - -	13
2nd „ „ - - -	42
3rd „ „ - - -	36
Total - -	226

* Three superintending schoolmasters included in this number were appointed subsequently to the 31st March.

As on the 31st March 1861 the establishment consisted of 191, the total increase in three years has been 35, or at the rate of nearly 12 annually, a result which verifies the estimate made by the Council in their First Report, page xxx.

There were also, on the 31st March 1864, engaged as assistant (or 4th class) schoolmasters, monitors, pupil-teachers, or students in the Normal and Model Schools at Chelsea, and at the Royal Hibernian School, Dublin, 98 persons who may be considered as under training for the office of schoolmaster.

The casualties among schoolmasters have been 29, or at the rate of about 10 per annum, The ranks have been recruited by 56 trained schoolmasters from the Training Schools at Chelsea, and by a few who have been taken on the strength provisionally from the Indian Establishment.

All the Assistant Inspectors concur in reporting favourably of the army schoolmasters.

Mr. Vicars says,—"The conduct of schoolmasters in this "district during the past year has been highly creditable to "them. As a body they are men of undoubted ability and "character."

Major Gleig says,—"I have received very few un- "favourable reports of schoolmasters from commanding "officers or others, either in respect of their conduct or "their ability and attention to their duties."

Mr. Sargeaunt says,—"It remains for me only to add my "belief that the army schoolmasters are zealously and "laboriously performing their duties to the best of their "ability, and that as a rule they deserve every encourage- "ment from those in authority over them."

Dress of Schoolmasters.

Army Schoolmasters, being enlisted soldiers, with the rank of non-commissioned officers, are required to appear in uniform. The dress first established, viz., a blue frock coat with braid, silk sash, sword and waistbelt, and forage cap with red cloth band, was found to resemble too much the undress uniform of a commissioned officer, and gave rise to inconveniences which were complained of by commanding officers, and even by some of the schoolmasters themselves. In 1863 His Royal Highness the Field Marshal Commanding-in-Chief, with the concurrence of the Secretary of State for War, was pleased to approve of a dress more in accordance with the military rank of the schoolmaster, viz., a blue frock coat as before, with chevrons (on both arms) of the colour and pattern of the chevrons worn by rifle regiments. The sash was suppressed.

III.

Schoolmistresses.

No change has been made in the status of schoolmistresses, but an improved system of first appointment has been introduced by the Regulations of 1863.

Pupil-teachers have been placed upon a superior footing; their salary, which was formerly fixed at 4*l.* a year, now commences at 6*l.*, and may be advanced by annual increase of 3*l.*, to a maximum of 18*l.* The minimum age for admission has been raised from 15 to 17 years, and before being appointed they are required to pass a satisfactory examination in elementary subjects and in needlework. They are eligible for admission, when of sufficient age, to training institutions, or if found qualified they may be appointed third-class army schoolmistresses without further training. A pupil-teacher may be appointed to assist the schoolmistress whenever the number of children in the infant and industrial schools exceeds 50.

Monitresses, being girls above 13 and less than 17 years of age, have taken the place of the former pupil-teachers, on a salary of 4*l.* per annum, and may be appointed when the number of children in the infant and industrial school exceeds 25.

A class of "*Assistant Schoolmistresses*" has been added to the establishment. These are selected from wives of non-commissioned officers, and are appointed to assist in the infant and industrial schools, on the same pay and conditions as pupil-teachers. Like them they are eligible for admission to training institutions; or they may be appointed to the third class of army schoolmistresses.

The principal object in making these changes has been to provide a more effective teaching staff than was before available; but a further and scarcely less important end was kept in view, viz., to raise within the army a body of trained teachers who might afterwards become army schoolmistresses.

The establishment on the 31st March 1864 stood as follows:—

Trained schoolmistresses - - -	205
Pupil-teachers - - -	27
Monitresses - - - -	98

The increase of trained schoolmistresses has been at the very low rate of five per annum, owing to the difficulty of obtaining persons with even the small amount of education required by the Regulations.

IV.

Inspection of Schools.

The number of Assistant Inspectors remains the same, namely, three; but a partial redistribution of districts has been made in order to relieve Division I., the duties of which had become excessive, in consequence of the large number of troops quartered in it. The three inspectional divisions are distributed as follows, viz.:—

Division I. Including London, Aldershott, the South-eastern Military District, Woolwich, Chatham, and Colchester.

Division II. Including Scotland, the Northern, Western, and South-western Military Districts.

Division III. Ireland.

They contain the following number of schools, viz.:—

Division I. Adults' schools	-	58	
Grown children's „	-	58	173
Infant and industrial „	-	57	
Division II. Adults' „	-	41	
Grown children's „	-	44	128
Infant and industrial „	-	43	
Division III. Adults' „	-	36	
Grown children's „	-	34	103
Infant and industrial „	-	33	
Total	-	-	404

Each of these schools is inspected at least once a year by the Assistant Inspector.

Local inspectors of schools are appointed, when required, to large garrisons abroad. They are selected from the officers of the garrison. They have inspectional charge of the schools, in addition to their own duties. The salary is 3*s.* a day. There are at present local inspectors at the following stations:—

Gibraltar,
Malta.

There was one also at Montreal in 1862–63, pending the appointment of a superintending schoolmaster, and one also at Corfu till that island was given up.

The General Reports of the assistant and local inspectors will be found at pp. 23–40 of the Appendix.

The seven superintending schoolmasters have been appointed severally to Aldershott, Dublin, the Curragh, Shorn-

cliffe, Portsmouth, Montreal, and Upper Canada. By their assistance the system of inspection will be made more close and effective; and when the number of superintending schoolmasters shall have been completed, there will be few regiments whose schools will fail to receive the advantage of being subjected to their experienced supervision and guidance. Already, Superintending Schoolmaster Little has been deputed by Lieut.-General Sir Fenwick Williams to inspect and to report upon the whole of the army schools in the two Canadas. The expense incurred in this duty has been well repaid by the useful information conveyed by Mr. Little, regarding the state of many of those schools which had not for several years been subjected to inspection.

The schools of the Royal Artillery at Woolwich have long been under the superintendence of Mr. C. Wharry, who holds the rank of quartermaster in the regiment.

Mr. Wharry also inspects the schools of the regimental depôts at Warley, Sheerness, Shoeburyness, Chatham, and Maidstone.

In India there is, it is believed, one assistant inspector, whose district comprises the whole of the Bengal, Agra, and Punjaub Presidencies. An officer of the army officiates as acting superintendent in the Bombay Presidency; while the army schools of the Madras Presidency are understood to be under the Civil School Commissioners. A scheme for amalgamating the Indian with the Royal establishment, and of organizing a system of inspection of schools in the Indian empire, has been submitted by the Council to the Field Marshal Commanding-in-Chief for the consideration of Government.

V.

System of Inspection.

In 1862 the Council introduced a system by which they hoped to render the inspections more close and useful, as well as to establish one standard of comparison throughout the whole of the army schools. In writing and spelling, the pupils were required to write 50 words from dictation, the errors being recorded and tabulated. In arithmetic, questions of a certain type were set, each question being numbered so that it was easy to record in tables all that had been properly solved. Geography and history were treated in the same manner. In reading, however, there could be no fixed standard.

Although this measure did not altogether fulfil the Council's expectations, it was a step in the right direction.

The tests above stated could be applied to those men only who presented themselves for examination, and it was soon found that these amounted, on the average, to less than one half of the number of men on the school books; and as the same men seldom attended two consecutive examinations, no opinion could be formed of individual progress.

The Council feeling the want of some arrangement that should bring under the eye of the inspector the work of every pupil, whether present or absent at the time of his visit, submitted in April 1864 a scheme, which it is believed will not only fulfil this condition, but will also place before the inspector and the Council the periodical advancement of the pupils. A full account of the system will be found in Appendix VI. No. 1. The leading features may be briefly described:—Every man on first joining the school is to be examined by the schoolmaster, and a record of his utmost attainments is to be kept in a book specially allotted to this purpose. Every six months he is to be again examined by the schoolmaster, and he is also to be examined at some convenient time during the month preceding the inspection, the work done by him being in each case entered in the same book; so that whether the man be present or absent at the annual examination held by the Assistant Inspector, his book will be forthcoming, and an opinion can be formed as to his progress in the school.

In Appendix VII. will be found a table showing the numbers of adults attending the last inspections; and of that table the following is a summary. The "numbers on the books" are the averages of the past year:—

Number of Corps.		Average Number on the School Books.	Present at the last Inspection.	Per-centage of those present to Number on the Books.
20	Cavalry	1,464	873	59·6
5	Guards	1,115	611	54·8
48	Infantry of the Line	11,286	4,179	36·1
22	Depôt Battalions	4,300	2,316	53·9
	Royal Artillery	2,205	850	38·5
	Royal Engineers	127	99	78·0
	Total	20,497	8,928	43·5

VI.

State of Education in the Army.

The following table, showing the present state of education in the army, has been deduced from returns received from

the Adjutant-General. The per-centage in the last column is taken from the Council's Report of 1862.

	Number returned.	Per-centage in 1864.	Per-centage in 1860.
Class 1. Who can neither read nor write.	22,570	13·44	18·95
„ 2. Who can read but not write.	29,054	17·30	19·72
„ 3. Who can read and write.	107,509	64·05	53·89
„ 4. Who have a superior degree of education.	8,717	5·18	7·44

This return does not include certain batteries of Royal Artillery and battalions of Infantry, from which no returns have as yet been received.

Although this table, when compared with that given in the Council's First Report, shows a progressive improvement in all but Class 4, it is apparent from it that the most elementary education is still required for more than 30 per cent. of the men in the ranks.

The following table shows the proportion of "uneducated" among the several branches of the service, comprising under that term Classes 1 and 2 of the above table. The per-centage in the last column is taken from the Council's Report of 1862 :—

	Classes 1 and 2, uneducated.	
	1864.	1860.
Cavalry - - -	20·80	22·03
Royal Artillery - - -	22·09	25·65
Royal Engineers - - -	3·44	5·36
Military Train - - -	35·06	42·37
Foot Guards - - -	9·73	10·96
Infantry of the Line - - -	36·40	45·62

From which it appears that the reduction in the proportion of the uneducated has been general throughout the services.

VII.

State of Education in the Schools.

In the Appendix VIII. will be found a table showing the state of education in the several adult schools which were

visited by the Assistant Inspectors, and the following is an epitome of that table :—

Corps.	Reading.			Writing.		Arithmetic.				Extra Subjects.			Number of Regiments.
	Letters and Monosyllables.	Easy Narratives.	Books of General Information.	From Copies.	From Dictation.	Simple Rules.	Compound Rules.	Proportion and Practice.	Fractions, Decimals, and higher Subjects.	Geography.	Grammar.	History.	
Cavalry and Military Train.	233	573	820	1,252	1,039	634	708	134	95	196	117	74	21
Guards (with Depôts).	222	312	850	930	979	419	634	108	156	465	0	128	6
Infantry of the Line.	2,115	3,794	5,801	8,482	7,854	5,075	3,958	1,307	982	1,503	421	814	50
Artillery - -	512	1,199	2,550	2,553	2,232	1,000	1,241	351	259	639	59	371	–
Engineers -	49	231	211	915	879	286	171	211	180	42	6	„	–
Depôt Battalions	962	1,340	2,212	3,656	3,060	1,484	1,721	518	380	816	357	450	24

Being compiled from the schoolmasters' returns prepared for the assistant inspector, the above table can be considered only as an approximation; for, though the schoolmasters' returns have been generally considered by the assistant inspectors fairly to represent the state of education in the schools, the opinion of the assistant inspectors has been based upon personal examinations of not more than 44 per cent. of the pupils.

The table is also incomplete in the number of schools, as very few reports have been received from regiments serving in India.

Of 3,878 adults examined in reading by Major Gleig, one of the assistant inspectors, 1,963, or 50 per cent. read fluently in his presence the Supplement to the Fourth Reading Book (Irish National Society), and other subjects of about equal difficulty.

Of 2,480 examined in dictation, 243, or about 10 per cent., wrote without error 50 words read to them from the Sequel to the Second Reading Book.

In arithmetic the result is not so satisfactory, for, though the table accompanying his report shows a fair proportion of men able to work simple questions in proportion, practice, vulgar and decimal fractions, Major Gleig observes, "That he has found comparatively few men able to work "sums in the compound rules, except as applied to money; "and that many men are unacquainted with the tables of "weights and measures in common use." This portion of

Major Gleig's report is recommended to the special attention of schoolmasters.*

Subjects of higher study are confined almost entirely to the History of England and Geography, in both of which the results of the examinations are reported by Major Gleig to have been, in most schools, of the poorest description, with two honourable exceptions, viz., the school of the Depôt Brigade of the Artillery, Woolwich, and that of the 78th Highlanders. However, owing to a misapprehension of the Council's instructions, many men reported by the schoolmasters as fit for examination in geography had not received the paper (C.) containing questions in that subject, and had no opportunity therefore of showing their proficiency in it.

VIII.

Attendance at School.

Irregularity in the attendance of adults continues to be the great obstacle to progress. This subject was very fully treated in the Council's first Report, and they regret to observe that no improvement has taken place since that period, although the education is now made perfectly gratuitous in all the classes.

In Appendix IX. is published a table showing the average number of non-commissioned officers and men whose names were on the school books during the year 1863, and also the average daily attendance and the average number of hours of attendance weekly. The great disparity that exists between regiments will be observed not only in the number of men attending the schools daily, but in the number of hours of instruction received by each man weekly. It is impossible to attribute this disparity to mere accident.

Mr. Vicars, assistant inspector in Ireland, observes,† "The "daily average of soldiers who are to be found in the "majority of schools in this district, does not bear a proper "proportion to the number enrolled in the registers (*i.e.* who "are on the school books); and the amount of time given in "the case of those who do attend is so small as to render it "idle to look for any substantial results."

Mr. Vicars then proceeds to show that where encouragement is given by commanding officers, the daily average of attendance rises in an approximate ratio to the numbers on the school books; and he considers that if the Horse Guards Order No. 686 of 29th June 1857 were generally enforced in its integrity, the results of the schoolmasters' labour would

* *See* Appendix, p. 23. † *See* Appendix, p. 28.

be greatly improved. "One paragraph of that Order states "that 'no man is to be considered eligible for promotion to "'the rank of corporal, unless in the field, who has not been "'dismissed the above class,' that is, who is not sufficiently "advanced in reading, writing and arithmetic.

In Appendix X., No. 1, will be found the Council's letter to assistant and local inspectors regarding the formation of special classes.

The following is an abstract of the table above alluded to. The table is necessarily imperfect, as monthly returns are liable to frequent interruptions:—

	Regiments, Battalions, or Stations.	Non-commissioned Officers and Men on the School Books.	Average Daily Attendance.	Number of Hours of Instruction weekly for Privates.
Cavalry and Military Train.	37	2,801	1,170	2·95
Guards, including Depôts.	7	1,800	632	2·81
Infantry of the Line	140	26,258	8,301	3·02
Artillery	—	4,117	1,402	3·86
Engineers	—	1,327	568	4·83
Depôt Battalions	25	4,521	1,903	3·11
Colonial Corps	9	1,039	445	3·54
Total regular Army as far as reported	217	41,863	14,421	3·44

On comparing this with the similar table at page xiv. of the Council's First Report, the following remarkable differences are apparent, viz.:—

1st. In the average numbers of adults on the school books there is a falling off of 6,780, or about 16 per cent.

2nd. In the average numbers daily attending school there is a falling off of 3,212, or about 18 per cent.

A decrease in the number of men who take advantage of the schools might be due to an improved condition of education in the army, the result either of school influences or of recruiting amongst a superior class of men. In such case the decrease of numbers on the school books should be in some degree commensurate with the improvements in the educational condition of the regiments, whereas it is very greatly in excess.

Mr. Vicars enters at considerable length into the statistics of this decrease of attendance so far as it is observable in the schools in Ireland, but he does not offer any suggestion as to the causes.

The subjoined table exhibits the distribution of this decrease.

COMPARATIVE TABLE of NUMBERS on the School Books of Regiments, &c.

Number of Regiments.	Where serving.	Numbers on School Books.		
		Former Return.	Present Return.	Decrease.
Forty-nine -	At home, per both returns.	7,877	7,696	181
Forty-nine -	In India, per both returns.	9,854	8,033	1,821
Twelve - -	In Canada, per present return.	3,704	2,625	1,079
Seven - -	In New Zealand, per present return.	841	597	244
Twenty-five Depôt Battalions.	At home, in both returns.	7,643	4,521	3,122
Miscellaneous -	- - - -	- -	- -	333
	Total decrease		- -	6,780 .

Some years back, as will be seen by Colonel Lefroy's Report on Army Schools (1859), it was the practice of the service to compel all recruits to attend the schools. In 1861 compulsory attendance began to be discontinued, and as recruits are congregated at depôts, it is in those battalions that we should expect to find the greatest decrease; accordingly, on referring to the above table, we find the falling-off in the 25 depôt battalions to amount to no less than 3,122, or to nearly half of the total difference.

IX.

CERTIFICATES (under authority of Horse Guards' Letter of 17th February 1860).

It has hitherto been left to the option of commanding officers to grant certificates on the recommendation of the schoolmaster. The Council have no return showing the number of certificates now in possession of the troops; but they believe that little use has been made of them generally. This is very much to be regretted, as such certificates not only afford a ready means of ascertaining the educational condition of regiments, but they are incentives to men to qualify themselves, educationally, for promotion.

The Council have proposed that certificates of education somewhat modified in form from the above should be granted by the commanding officers, on the recommendation of he

assistant inspector, after each examination or inspection. Specimens of the certificates will be found in Appendix VI., No. 3.

X.

Course of Instruction.

The old system of classification to be found at page viii. of the First Report was formed when the partial payment of fees rendered it necessary to classify the men, with some strictness, according to their acquirements, in order to preserve a clear line of demarcation between the paying and the non-paying scholars. All fees in the adult school having been abolished, the necessity for this peculiar and very inconvenient classification no longer exists; and the Council consider it to be a matter of great importance that separate classes should be formed in each branch of instruction. This would render the process of instruction more simple and easy for the schoolmaster, and it would stimulate the pupils to exertion, by providing better for their advancement in each subject. Whereas under the existing system a man may read and write well enough to be in the first class, yet, for want of capacity for arithmetic, he is kept in a lower class, to his great discouragement; or, if he be promoted to his proper class in reading, he becomes a hindrance to those who are more advanced than himself in ciphering.

The most valid objections urged against this classification are, that it often necessitates a general change of seats in the middle of an attendance, giving rise to noise, confusion, and loss of time; and that men attending irregularly are often thrown upon one branch of study for several successive attendances. In one half of the schools, however, an attendance is limited to a single hour, which is not generally too much for either reading or arithmetic. In such schools no change of seats will be required. In schools where the attendance is prolonged to one hour and a half, half an hour of each sitting may be devoted to writing; and if it should appear that the accidents of attendance favour one branch of education more than another, the schoolmaster should have authority to make a temporary change in the studies.

Upon a full consideration of the subject, the advantages of this system appear to preponderate so much over the disadvantages, that the Council have strongly recommended the separate classification to be carried out in all the army schools under their superintendence from the 1st January next.

The above recommendation has received the sanction of H. R. H. the Field Marshal Commanding-in-Chief, and of the Secretary of State for War.

XI.

Special Classes.

Although the adult schools have been undoubtedly efficacious in improving the previous education of many non-commissioned officers and soldiers, and even in educating some to a fair degree of attainment who, when they joined the army, were wholly illiterate, still it must be confessed that the extreme irregularity of the attendance, caused by the multiplicity of duties incident to the soldiers' life in camp or quarters, is a most serious bar to education, and must even render it in many cases questionable whether the results are at all proportionate to the expense of army schools. The Council have given their most anxious attention to this question, as on its possible solution depends the efficiency of the present army school system.

It will be seen by the abstract given above that the average amount of schooling for a soldier is about three hours and a half per week; while from the table in Appendix IX., it will be observed that in many regiments the men are not able to attend so much as two hours in the week.

To expect results commensurate with the large expenditure incurred would, under such circumstances, be evidently vain; and were the question to be finally left in this unsatisfactory position, the cause of education, as respects non-commissioned officers and soldiers, would be far from hopeful.

There is, however, a way of meeting this difficulty, which has already been adopted in several corps, and which the Council earnestly hope will ultimately be adopted in all. This is to form, in addition to the ordinary classes, a special class of men selected for their good conduct and the promise they give of becoming eligible for the higher non-commissioned ranks; and to arrange that these shall attend school for at least two or three hours every day, or on as many days as their indispensable duties may permit. Usually this class consists of about three men per company. After a period varying from six to nine months the men composing it will be found sufficiently advanced to be dismissed, and another similar class can be formed. By this means a large body of men in every regiment may in process of time be fairly educated, and the school will then have conferred upon the regiment a direct advantage which can hardly be over-estimated—that of having a large field for the selection of well-educated non-commissioned officers.

On this subject Mr. Vicars's report is full and valuable. He considers that the special class system cannot fail to be followed by the most satisfactory results, if the purposes it was designed to subserve are kept steadily in view, and the scheme

is adopted in all its integrity. In the course of his late inspections he witnessed two or three remarkable examples of its success; but in general he considers that the system, in Ireland at least—the field of his inspection—has not had a fair trial. Thus, while even in those corps where special classes are looked upon with favour by the commanding officer, the attendance given by each man has not exceeded 15 or 16 hours weekly; in others the attendance has been as low as from one to five hours; and Mr. Vicars concludes the subject by observing: "The special class system can be "adopted in every battalion or regiment with little or no real "difficulty; and if, when dismissed drill, three or four men "per company, selected by the captain, subject to the approval "of the commanding officer, were taken off all duty, except "that of guards, for the purpose of attending school as often "as possible, not only would there always be men fit for "promotion, but, in a comparatively short period, the illite- "rate soldier would be the exception, and the half-yearly "returns of the state of education would show a most marked "and unequivocal progress. The success of this system may "fairly be said to rest chiefly with commanding officers. If "their co-operation is given to it, and their sympathy is "enlisted in its favour, no difficulties will ordinarily arise "which will not yield to judgment, patience, and per- "severance."

Mr. Sargeaunt observes that where special classes have been established, the most satisfactory results have followed.

The Council would earnestly recommend this subject to the attention of commanding officers.

Since writing the above, the following statement has been received with Mr. Vicars' recent inspection report on the schools of the 32nd Light Infantry, stationed in Dublin, and a more favourable illustration of the benefits to be derived from special classes could hardly be imagined.

"A special class consisting of three men per company was organized in May 1863; the result is as follows:—

"18 have been promoted.
4 sent to the Fleetwood School of Musketry.
2 appointed school assistants.
1 to pay office.
1 to orderly room.
1 passed for commissariat staff.
1 gone to depôt.
1 servant to an officer.
1 dismissed for misconduct."

Thus nearly all the men who entered the special class 12 months ago, are raised above their original station, the majority having become non-commissioned officers in the regiment."

In the 2nd battalion, 12th regiment, a special class was formed in November 1862, since which time 30 of its scholars have been promoted to the rank of non-commissioned officer.

Major Gleig, in a supplementary report on special classes in 1863, writes as follows:—

I think it is much to be regretted that the establishment of special classes upon the principle described in the circular letter of the Council of Military Education, dated 2nd May 1862,* has not become general, or even very common. The number of such classes reported to me in 1863 never exceeded 14 in any one month, exclusive of the special class of non-commissioned officers at Woolwich, and it was usually under 12. In the majority of cases too, the arrangements recommended in the circular were only imperfectly carried out, inasmuch as many other duties besides guard-mounting were allowed to stand in the way of a man's attendance at the instruction given in the special class.

I cannot undertake to say positively why it is that that which has been accomplished in some regiments, and has been found in them to produce excellent results, has either not been attempted, or has failed of success in others, of which the circumstances, to outward appearance, have been precisely similar. But I think that the difficulty of establishing special classes, and of securing a regular attendance at them when established, has more frequently arisen from the opposition, or at any rate the disinclination, of the captains of companies or of their subordinates, than from that of commanding officers of regiments. It is within my knowledge that in some cases in which special classes have been established, the men detailed from particular companies to attend them have been too frequently changed, and so the principle of the arrangement has been vitiated. For it is of the very essence of it that a man once appointed to attend the special class should not be withdrawn from it, except under very urgent circumstances, until he has made some useful amount of progress in his studies.

It is plain that if a man receive instruction frequently and regularly, he will make greater progress than if he were to receive it infrequently and irregularly; and I think it will be generally conceded to be for the good of the service that young men who are deficient in the knowledge of reading, writing, spelling, and keeping accounts, but are in other respects well qualified for the rank of non-commissioned officer, should be brought on rapidly in the study of these things, if by any means this can be managed. I am assured by commanding officers who

* See Appendix X., No. 1.

have carried out the special class system, even to a limited extent, that the benefits of it are palpable; and I cannot but think that, for the sake of securing these, three men, or even five men per company, might very well be spared in most regiments, under the ordinary conditions of service in time of peace, to attend school regularly and frequently,—but above all things, regularly.

It seems superfluous to say that whenever I have had the opportunity, in inspecting a school, of observing the progress made by men who have attended a special class for any length of time, I have found it to be greater than that of men attending the ordinary classes of the same corps, in proportion as the attendance of the special class has been more regular and more frequent than that of the others.

A. C. Gleig,
A. I. A. Schools.

Quarter-master Wharry, who so ably superintends the schools of the Royal Artillery at Woolwich, and Warley, has always been a strenuous advocate for special classes, of which there is an excellent one for non-commissioned officers established at Woolwich, and the Council consider that they can hardly recommend the system more effectually than by publishing in Appendix X., No. 3, some of the papers received with Mr. Wharry's inspection report in December 1863; these papers are by a serjeant, who when he joined the Artillery eight years before could not read correctly a sentry's board of orders; he had not been at school since he was eight years of age, and although he had obtained some instruction from the acting schoolmasters of the Royal Artillery at Halifax, he had never been regularly taught until he joined the special class at Woolwich in April 1863. Considering that this man had been but nine months in the class, his work cannot but be considered as indicative of extraordinary progress. He is indeed allowed to be a man of superior mental capacity; but in the absence of a special class it is not too much to say that his powers would have remained undeveloped.

XII.

Children's Schools.

These schools are available to the children of all soldiers in garrison, as well as to those of several other classes connected with garrisons. The admission is not perfectly gratuitous, a small fee being required from each child. The scale of payments, as well as the classes entitled to the privilege of sending their children to the schools, will be found in Article

104 to 110 of the Regulations for Army Schools, (*Vide* Appendix XII., pp. 136–7.)

The schools are of three descriptions.

1*st.*—*The School for Grown Children.*

This comprises all the boys and girls who are able to read words of two syllables. These children are classed together according to their attainments, without reference to sex, and they are taught by the schoolmaster and his assistants.

The hours of attendance for boys and girls are, in European climates, from 9 a.m. till noon. In the afternoon there is an attendance for the boys alone, varying from one to two hours, according to the requirements of the adult schools, as a separate class-room is seldom available.

According to the latest returns there were, attending these schools,—

Boys - - -	4,212
Girls - - -	3,402
Total - -	7,614

Opinions differ on the subject of mixed classes of boys and girls. The mixed system is, however, almost a necessity in regimental schools, where the schoolmistress is fully engaged with the infant and the industrial schools, so that a separation of the sexes would entail the expense of a second schoolmistress, and one of a higher educational training.

In the schools of the Royal Artillery at Woolwich the grown children are instructed upon the separate principle, as also in those of the Royal Engineers at Chatham, and the high reports that the Council receive of these schools would, taken alone, be strong arguments in favour of the separate system. These schools enjoy, however, the advantage of being large, of being stationary, and of having most able superintendence.

Another point that has given rise to much discussion is the comparative value of regimental and of garrison schools for grown children. At stations occupied by single corps the regimental system alone is practicable: but where two or more corps are quartered together, the question arises whether it is not better to unite the children of all in one large school. This subject was very fully considered by the Council in their Memorandum of 31st July 1861. *See* Appendix I., p. 15. The advantages of the regimental system are these: the school is more immediately under the eye of the commanding officer, and the schoolmaster will take more pains in teaching when the result must affect his own credit. On the other hand, while in a regimental school the

attention of the master is devoted chiefly to a few children in the first class, the others being left to untrained soldier assistants; in the garrison schools, especially those in large garrisons, almost every class is instructed personally by a trained schoolmaster; and it cannot be doubted that this must give the garrison school a very great superiority so far as intellectual education is concerned. Still the feeling, and a very commendable one, of commanding officers, in favour of having the children under their own immediate supervision and influence is so strong, that garrison schools for grown children are quite the exception, being confined to a very few stations, and at these only where separate school-rooms have not been provided.

Major Gleig observes in his report,—"In the great majority of schools of grown children which I have inspected, the pupils have appeared to possess fair but not superior intelligence for their years and station. They have been taught reading, writing, and spelling successfully, but the number of schools in which arithmetic has been thoroughly well taught is somewhat less."

He describes the knowledge of English history to be very small in most schools; that of geography to be somewhat better. He then comments upon the want of a general system of teaching geography, and suggests a remedy which the Council will take into consideration.

Mr. Vicars reports the children's schools in Ireland to be in a satisfactory condition; the attendance to be, for the most part, regular; and the attainments of some of the senior classes to be very creditable.

He says—"The state of the grown children's schools in the army is generally satisfactory, and will bear comparison with that of any similar schools in the country." In his last annual report upon the schools of the 16th Depôt Battalion, Templemore, Mr. Vicars mentions in terms of warm approbation a system of "home lessons" adopted by 1st-class schoolmaster, R. Kirk.* "This system," he observes, "is an admirable one, and a most useful auxiliary to the ordinary studies of each day. It serves also to bring the senior master into direct communication with each child in the school, so that all the classes are equally under his supervision."

The Council concur entirely with Mr. Vicars regarding

* Since promoted to be superintending schoolmaster.

the advantages he has suggested; and they would add that the preparation of the "home lessons" will often interest the parents of a child, and enlist their sympathies in favour of the school. The Council recommend this subject to the consideration of army schoolmasters.

The following remarks by Major Gleig on the manners of the children have given great satisfaction to the Council:—
"I have observed a great improvement in the past year in "the manners and appearance of the children present at the "inspections. How far it has extended itself beyond the "precincts of the school-room I am not in a position to say, "but it may reasonably be hoped that the habit of self-"control and politeness in school is not altogether without "an influence upon the children when they are elsewhere. "At any rate, the improvement, so far as it goes, is unde-"niable, and it is creditable to the teachers by whose exer-"tions and attention it has been brought about."

2*nd*.—*The Infants' School.*

This is intended for all children of both sexes until they can read words of two syllables. There is, however, a special provision that boys shall not be kept in the infant school after attaining the age of eight years. This school is under the sole charge of the schoolmistress. The usual hours of attendance in European climates are from 9 a.m. till noon, and again from 2 till 4 p.m.

According to the latest returns there were attending these schools—

Boys - - -	4,027
Girls - - -	4,240
Total -	8,267

In regard to infant schools, the argument in favour of the garrison system is stronger than in the case of the grown children's schools. By the school regulations one schoolmistress only is allowed to 25 children. The ages of these children ranging between four and eight years, three or four classes are necessary for educational purposes; and while the schoolmistress is teaching one class, the other classes must be kept in order. This is the weak point of the regimental infant school, and it is avoided in the garrison system, where a plurality of teachers affords efficient superintendence to each class. Nor does the objection as to the withdrawal of the

children from the supervision of the ladies of the regiment apply so strongly in this case; for as the children are grouped regimentally in the school-room for industrial teaching in the afternoon, opportunity is afforded to officers and ladies of visiting those children in whom they feel interested. But here again the feeling of commanding officers and others in favour of separate schools is found to be so strong, and the advantages of a hearty interest on the part of the officers and ladies of a regiment is so important, that the Council are induced to recommend that infants' schools shall be part of the regimental system, and be conducted, wherever that be practicable, in a separate school-room.

When thus conceding the general principle of separate infant schools, the Council would make one exception.

There are many young women employed in the army schools who have received no regular training, and it becomes almost a necessity that there should be at least one large garrison school in which these young persons may receive some instruction in the art of teaching. For the site of such a school few garrisons could be more suitable than Aldershott, through which nearly all regiments pass in the course of their home service; and where there is already in existence a school of this description situated in the permanent Infantry Lines. This school, conducted by a 1st-class schoolmistress of very superior attainments, has given very general satisfaction, and the Council have never received reports of any disinclination on the part of commanding officers to send their children there. The Council, therefore, recommend that for the present at least this garrison school for infants should be maintained on its present footing.

3rd.—The Industrial School.

This comprises all the girls of the grown children's school, and as many boys and girls of the infant school as can profit by the instruction. The latter consists of lessons in plain needlework, given by the schoolmistress and her assistants.

An annual allowance of 5*s.* per head is granted by the State towards providing the requisite materials. All articles made up in the school from the materials so provided are distributed as rewards to the children, at the discretion of the commanding officer. Children are also encouraged to bring their own work.

This very useful branch of teaching is deservedly appreci-

ated, and there are now in these schools 9,402 children of the two sexes.

Nearly all those who attend the industrial schools belong also to the schools of the grown children or infants. The general return, therefore, of children receiving education in the army schools is as follows:—

Grown children - - -	7,614
Infants - - - -	8,267
Total -	15,881

of whom 9,402 take advantage of the instruction given in the industrial schools, the remaining 6,479, being for the most part boys of the grown children's school, or infants not old enough for the instruction.

The regulated holidays are three weeks at Midsummer and the same at Christmas, besides a half holiday on Saturday during the remainder of the year.

It is much to be regretted that so few army school-rooms have playgrounds attached to them. It would tend greatly to the moral and physical education of the children if, during the hours of recreation, they could play together under easy supervision of the master or mistress, instead of loitering in the streets or the barrack square in search of amusement; and the Council would strongly recommend that, wherever practicable, a piece of ground adjoining the school-room should be enclosed for the recreation of the children.

XIII.

Religious Instruction.

The children's schools are opened with prayer, followed by a Bible lesson, the attendance at which is voluntary.

Article 96 of the new regulations gives the chaplain the opportunity of making the Bible lessons of the schoolmaster, if a Protestant, harmonize with his own course of instruction. Major Gleig reports:—"Most of the chaplains in the district "in which I inspect have assumed a certain control over the "schoolmasters, in respect of the religious instruction of the "children, according to the provisions of the school regula- "tions. I hear satisfactory accounts from them of the "working of the new system; and I am most happy to "report that I have heard no chaplain speak in other than "approving terms of the manner in which the schoolmasters "have co-operated with them in carrying out this part of their "duty."

Major Gleig also notices an improvement in the Bible lessons given to the children, by the schoolmasters.

Under the new regulations, the schoolmasters, schoolmistresses, and pupil-teachers are required to assist the clergymen of their own denomination, not only at the religious weekly instruction, but also in the Sunday schools.

XIV.

Royal Military Asylum, Chelsea.

This institution consists of a school for the orphan boys of soldiers of the regular army established in 1803, and of a Normal school for training army schoolmasters, established in 1846.

The Normal School.

This establishment contained, on 31st March 1864, 41 students, of whom 15 were from civil life; 12 were non-commissioned officers of the army; 14 had previously served as monitors in the Royal Military Asylum, or in the Royal Hibernian school, and, subsequently, three years as assistant army schoolmasters.

Of the above students 27 were studying in the Normal school, and 14 were being trained in the art of teaching in the Model school.

Students are admitted by competitive examinations, conducted by the head master, twice a year. Previous to August 1861 two vacancies had always been reserved for army candidates; but since that date the competition has been open, without distinction, to civil and military candidates, under the regulated conditions. Under these altered circumstances there have been admitted—

21 civilians.
17 soldiers.

The result of these competitive examinations has been highly satisfactory in proving that military candidates are able to enter into the competition with fair prospects of success. The Council earnestly invite commanding officers to encourage candidates to come forward.

The tables to be found at Appendix XIII., No. 1, show the results of the several examinations for admission into the Normal school since January 1861.

Papers set at the last examination for admission will be found at Appendix XIII., No. 2.

The students are divided into two classes or divisions. The weekly distribution of time is shown in the following table:—

	Classes.	
	1st.	2nd.
	Hours.	Hours.
Religious instruction	2	2
Mathematical instruction:—		
Arithmetic	1	2
Algebra	2	2
Euclid	1	2
Mechanics	1	0
Trigonometry	1	0
English history	2	2
English grammar	2	2
Reading	1	1
Geography	2	2
Fortification	2	2
Model drawing	4½	4½
Vocal music	5½	5½
Chemistry	2	2
Physics	1	1
Obligatory private study	5	5
Examination	2	2
Drill and gymnastics	6	6
Total	43	43

The students remain one year in the Normal school, after which they are subjected to an examination under the Council of Military Education, and, if found qualified, are transferred for 12 months to the Model school, in the duties of which they take part while being instructed in the art of teaching. Students who possess superior qualifications may, however, pass out of the schools in less than two years.

The papers set at the last examination of the pupils in the Normal school will be found in Appendix XIII., No. 4.

The following are the reports of the examiners in the principal subjects of the examination held in December last:—

From the Report of the Rev. Canon HEAVISIDE, M.A.

"As usual, the candidates have done well, showing that they are well grounded in the several subjects of examination. In general, the papers are written out with care, and the work is done accurately. The paper in which the least proficiency was shown was that of plane trigonometry; and

as it is an important subject, I draw attention to the fact. Still the deficiency was rather comparative than absolute, and I have no doubt, with a little more practice, every one of the candidates would be able to solve correctly the ordinary questions in which the determination of the elements of a triangle would be required. I was always impressed at the Normal school with the careful manner in which the candidates appear to be instructed; and the present examination rather strengthens my previous impressions."

From W. Stebbing, Esq., M.A., Fellow of Worcester College, Oxford.

"The students at the Normal school have answered my papers thoroughly and accurately. Geography seems to be their favourite subject, but the answers to the questions in the histories of Greece and Rome show nearly an equal amount of information. As in other years, they have acquitted themselves best in these three papers. In them, so far as regards the quantity and exactness of knowledge, nothing more complete could fairly be expected. The marshalling and arrangement of the facts is not quite so good.

"The English history work is not equal to the ancient; it is respectable, and that is all.* I may say the same of English grammar.

"The Indian and Colonial history is better done than usually, but the text-book in use is too meagre."

From the Rev. W. Kingsley, B.D.

"The drawings show, as usual, that the students have acquired a sound knowledge of elementary forms, and that they have taken great pains with their work, but none of them appear to have so remarkable a power of drawing as I have sometimes seen.

"The drawings of the boys in the Model school are most creditable to both pupil and teacher."

Certificates.—On leaving the Model school the students who qualify for the office of army schoolmaster are furnished with certificates of qualification. These certificates are of three degrees. The highest, called the "first-class special certificate," is an acknowledgment of great distinction both

* A more comprehensive text book than the one then in use has since been supplied, and the result is already much more satisfactory.

in the Normal school as a scholar, and in the Model school as a teacher. The second-class special certificate is granted where the qualifications in both schools are also of a high order; the third, or ordinary certificate, denotes satisfactory qualification. Specimens of these certificates will be seen at Appendix III., No. 2.

In Appendix XIII., No. 3, will be found tables showing the results of the examinations held since December 1861 inclusive.

Model School.

The authorized establishment of boys at the Chelsea Asylum is 500. The actual number on 31st December 1863 was 493, of the following ages:—

Under 6 years -	3
From 6 to 7 years -	14
„ 7 to 8 „ -	31
„ 8 to 9 „ -	31
„ 9 to 10 „ -	66
„ 10 to 11 „ -	82
„ 11 to 12 „ -	93
„ 12 to 13 „ -	87
„ 13 to 14 „ -	76
„ 14 to 15 „ -	9
„ 15 to 16 „ -	1
Total -	493

The boys are received between the ages of 5 and 10 years; and, under ordinary circumstances, they are not kept after 14.

The elder boys are instructed either in music or in trades, the distribution being at present as follows:—

Musicians - -	64
Drummers and fifers -	49
Tailors - -	83
Shoemakers - -	91

From the following table it appears that out of 225 boys whose time has expired since the Council's last report, 19, or 8·4 per cent., were reported unfit for the army; and that of the 206 reported fit, 151 or 73·3 per cent. volunteered for the army, and three volunteered for monitorships and the subsequent career of army schoolmaster.

The proportion (73·3 per cent.) of those reported fit who

have volunteered for the army, is a small increase upon that stated in the last Report.

Years. From 1st Jan. to 31st Dec.	Average Strength.	Number of Boys whose Time expired.			Number of Boys reported fit for the Army.			Remarks.
		Fit for Army.	Unfit.	Total.	Volunteered for Army.	Remained as Monitors.	Delivered to their Friends.	
1861	497	72	2	74	47	1	26	
1862	491	73	7	80	60	2	11	
1863	492	61	10	71	44	1	16	
Totals	1,480	206	19	225	151	4	53	

The following return has been drawn up from reports received from the several regiments to which the boys of this institution have volunteered, and exhibits in a very favourable view the effects of good early training:—

Reports from 100 Regiments.—1st January 1864.

Rank.		Character.	
Staff Serjeants	16	Exemplary	111
Serjeants	32	Good	343
Corporals	37	Indifferent	24
Drummers	155	Bad	5
Privates	242		
Total	483		483

Boys who have been instructed as musicians or trained as drummers are much sought after by commanding officers of regiments.

The comparatively small proportion of boys who eventually become non-commissioned officers is attributable to the circumstance of the majority being placed in regimental bands, which have but one serjeant on their establishment.

Educational Department.

This consists of a head master, assisted by five masters and 18 pupil-teachers and monitors.

The educational condition of the school is exhibited in the following statement. The school consisting of 493 boys, there are,—

	Number.
Learning reading	493
,, writing on slates	493
,, ,, on paper	468
,, ,, from dictation	435
,, arithmetic, slate	493
,, ,, mental	493
,, algebra	58
,, Euclid	58
,, mensuration	30
,, outlines of natural philosophy	30
,, geography	383
,, English grammar	348
,, analysis of sentences	87
,, etymology	121
,, English history	348
,, Sacred ,,	493
,, Colonial ,,	61
,, model drawing	58
,, vocal music	336

In June 1863 the Council deputed their colleague, the Rev. Canon Moseley, to examine the schools of the Asylum. His report, which gives in general a very favourable account of the acquirements of the boys, will be found in Appendix XIII., No. 5. The circumstances stated as to their physical condition compared with that of the boys of Greenwich Hospital, are under investigation.

XV.

Royal Hibernian Military School.

This establishment consisted on the 31st December 1863 of 410 boys, of the following ages:—

Under 8 years	10	From 12 to 13 years	79
From 8 to 9 years	25	,, 13 to 14 ,,	94
,, 9 to 10 ,,	47	,, 14 to 15 ,,	5
,, 10 to 11 ,,	67		
,, 11 to 12 ,,	83	Total	410

From the following statement it appears that during the years 1861, 1862, and 1863 there were 225 boys whose time had expired; of whom 26, or 11·5 per cent., were reported unfit for the army, and 199, or 88·5 per cent., fit for ser-

vice in the army. Of the latter number 168 volunteered for the ranks, and 4 for monitorships, making 172, or 86·44 per cent. of those reported fit, who volunteered for the army, which is a considerable increase upon the former returns.

Years.	Average Strength.	Number of Boys whose Time expired.			Number of Boys reported fit for the Army.				Accounted for in the Returns from Regiments.	Remarks.
		Reported fit for the Army.	Reported unfit.	Total.	Volunteered for the Army.	Remained as Monitors.	Apprenticed to Trades.	Delivered to their Friends.		
1861	410	42	4	46	39	-	1	6	713	
1862	410	65	11	76	52	3	2	19	755	
1863	410	92	11	103	77	1	1	24	771	
—	1,230	119	26	225	168	4	4	49	—	

ABSTRACT of the Number of Boys formerly in the School, and now serving in the Army, with their Characters, compiled from Returns from every Regiment and Corps in the Service.

Rank.	Number in each Rank.	Character.	Numbers.
Officers	8	(One of these officers deceased since this return was compiled).	
Bandmasters	5		
Serjeant-majors	3		
Enlisted schoolmasters	13		
Quartermaster-serjeants	4	Exemplary	38
Troop serjeant-majors	3		
Colour-serjeants	12	Very good	144
Trumpet and drum-majors	7		
Serjeants	34	Good	531
Orderly room clerks	2		
Paymaster's clerk	1	Indifferent	50
Lance-serjeants	3		
Corporals	35	Bad	15
Lance corporals	14		
Bombardiers	5	Very bad	3
Musicians Drummers Gunners Sappers Privates and Boys	632		
Total	781	Total	781

The following was the distribution of the boys as to trades on 31st March 1864:—

Musicians - -	- 33
In training for ditto -	- 20
Drummers and fifers -	- 58
In training for ditto -	- 23
Shoemakers - -	- 36
Tailors - -	- 108
Carpenters - -	- 6
Not posted - -	- 126
Total -	- 410

The following was the distribution of the boys in regard to subjects in school:—

Reading - -	- 402
Writing on slates -	- 402
„ on paper -	- 247
„ from dictation	- 266
Arithmetic - -	- 402
Algebra - -	- 12
Mensuration -	- 20
Elementary mechanics	- 73
Geography - -	- 402
English grammar -	- 266
„ history -	- 402
Sacred history -	- 402
Drawing - -	- 266

The numbers learning algebra and mensuration at this date were far less than usual, owing to peculiar and fortuitous circumstances.

Educational Department.

This consists of four masters, two army schoolmasters, and ten monitors or pupil-teachers, but the two army schoolmasters will shortly be replaced by two monitors, the complement of which will then be 12 instead of 10.

XVI.

Lectures to the Troops.

Great pains have been taken to encourage the system of lecturing. In October 1862 a general order was issued by H.R.H. the Field Marshal Commanding-in-Chief, calling

upon commanding officers to give their assistance, and the result has been very satisfactory. The Council, in their First Report, returned 461 as the number of lectures given during the winter of 1860–61 at 22 stations; and it will be seen by the tabular statement (Appendix XIV., No. 1), that 1,052 lectures were given to the troops during the winter season of 1863–64, and that the number of stations at which lectures were given has risen to 56. Of the above lectures, 43 were given by officers, 58 by chaplains; and the remainder, or nine-tenths of the whole, were given by army schoolmasters, a result which is highly creditable to that body. A list of those who have lectured will be found in Appendix No. XIV., No. 2.

The subjoined memorandum has been supplied by Mr. McLeod, Head master of the Model school, Royal Military Asylum, to whom the Council are much indebted for the very efficient manner in which he has carried out their wishes in the provision and circulation of the magic lantern and other lecturing apparatus.

Magic lanterns were supplied to all large garrisons where required. Boxes of slides exhibiting useful and amusing subjects were in constant circulation among 41 stations at home and 26 abroad, independently of those in India.

In Appendix XIV., Nos. 3, 4, will be found the rules for the circulation of the slides, and a catalogue of slides and diagrams now in use.

At some few stations electric apparatus has been supplied for the use of lecturers; this, as a general rule, can be done only at stations where there is a permanent school, and where there is a schoolmaster who is competent to lecture on experimental science.

MEMORANDUM by Mr. McLEOD on the LECTURES delivered to the TROOPS during the WINTER SEASON of 1863–64.

"On referring to the tabulated statement it will be seen that more than 1,000 lectures have been delivered to the troops between the 1st October 1863 and the 1st April 1864. The actual number of lectures given cannot however be estimated, as no returns have been received from the foreign stations, with the exception of Bermuda, Barbados, Montreal, Quebec, Toronto, and the other stations in Canada.

"Some new features have been introduced during the last season which are worthy of notice. In addition to the lectures specified in the general order, concerts and readings from the poets and novelists have been tried at several stations, and with very favourable results. The stations at which concerts and musical entertainments were given are indicated in the tabulated

list by the letter C; the readings were given at Aldershott, Barbados, Colchester, Devonport, Edinburgh Castle, Kingston (Canada West), Portsmouth, Stirling, and the Royal Military Asylum.

"At some stations vocal and instrumental music was introduced in connexion with the magic lantern lecture, also with beneficial results. Such rational methods of interesting and improving the men might be generally adopted.

"Lectures on scientific subjects, such as chemistry, electricity, light, &c., were delivered at the following stations:—Aldershott, Athlone, Buttevant, Colchester, the Curragh, Kingston (Canada West), Limerick, Parkhurst, Quebec, Shorncliffe, Stirling, Windsor.

"There are now 47 stations at home and 17 foreign stations where lectures are regularly delivered during six months of each year. And to provide illustrations for the magic lantern lectures there are more than 40 boxes of slides in circulation, and new subjects are being prepared to meet the increasing demands. As specimens of the kind of subjects that have been added to the list during the year, the following may be noted:—Japan and the Japanese, English History, European Cities, Mexico and the Mexicans, Russia and the Russians, Views in Canada, Battle Scenes.

"Comic slides were in great demand during the winter months, for the purpose of giving the children attending the regimental schools an evening's entertainment. Additional boxes were therefore purchased and forwarded on application to Canterbury, Portsmouth, Shorncliffe, Shoeburyness, Warley, Woolwich, Athlone, Templemore, and the Curragh.

"During the year 1863 slides for magic lantern lectures were supplied to Gibraltar, Montreal, Mauritius, and Cape Coast Castle; chemical apparatus to Gibraltar and Kingston, Canada West; and lanterns for dissolving views to Quebec."

XVII.

Garrison Libraries.

Since the submission of the Council's last Report, a complete system of libraries and recreation rooms for the troops has been organized, and this is now in general operation. The rules and regulations will be found in Appendix XV., No. 1. The general principle of the system is, that while libraries are common to all the troops in a garrison, recreation rooms are regimental institutions, for the use of the men of each regiment separately.

In the regiments of Foot Guards, in the Royal Artillery, and in the corps of Royal Engineers, libraries had long been established, and as officers and men had contributed very materially towards their formation and support, these libraries

have been permitted to remain as regimental or battalion institutions.

At a few important stations the librarian is supported at the public expense; but, in general, his salary is provided from the funds of the recreation rooms, and not from the obligatory annual contribution of 1*l.* per company, which is devoted to the purchase of new books and to the repair of old ones.

A list, see Appendix XV., No. 2, has been compiled from the quarterly reports of garrison libraries for the quarter ending 31st March 1864, unless where otherwise specified. From this list it appears that the garrison libraries contain 160,446 volumes, and that the circulation among the men, during the last quarter, has amounted to 92,791 volumes.

The contributions received from recreation room funds show a total of 641*l.* 9*s.* 1*d.* This must, however, be considered as an approximation, for some little difference still exists in the mode of showing these contributions in the accounts; and at some stations, where there is only one corps, the salary of the librarian is charged in the recreation room accounts, whereas, by Article XI. of the regulations, it should be considered as a contribution from the Recreation Room Fund to the garrison library. The Council hope to have all such anomalies rectified before the publication of their next report.

At Appendix XV, No. 4, will be found an interesting report by the Rev. T. R. Maynard, chaplain, on the garrison library, &c., Canterbury, showing the principle of classification adopted in that library, and the number of volumes in each class.

As might be expected, works of fiction are the most popular; after these, voyages and travels are the favourites. Poetry and general literature also find readers in the barrack-room.

When left to themselves it is found that the greater number of the subscribers to the library content themselves with calling for the books which they have seen in the hands of their comrades, and thus the reading is confined to a certain set of works which are in continual circulation, to the exclusion of the rest. To meet this difficulty, the Canterbury committee propose to issue printed catalogues of the books, in the hope that the men may be induced to select for themselves, and extend their choice of reading. The plan is very commendable, and the Council will be glad to learn that it proves successful.

XVIII.

Regimental Recreation Rooms.

The accommodation for these important institutions is at present confined to such spare barrack-rooms and huts as can be made available for the purpose, with reference to the general requirements of the troops. Many corps have only one recreation room; some have no place for reading and amusements beyond the garrison library, and at a few stations the library room is sufficiently large for the accommodation of the books only. But when the new system shall have been carried out to the extent contemplated by Government (*see* War Office Circular No. 846 in the Appendix) each regiment will possess a building 130 feet long and 33 feet broad, containing two commodious rooms for reading and games, as well as a bar for refreshments.

Recreation rooms are supplied at the public expense with furniture, games, utensils, fuel, and light. It is intended to furnish the walls with maps and charts, and with diagrams on subjects of useful and interesting information. A grant of 2*l.* 10*s.* per annum is made to each troop, company, and battery; of which sum 1*l.* at least is required to be contributed towards the support of the library of the station, the rest, in addition to the subscriptions of officers, non-commissioned officers, and privates, being available for supplying the recreation room with newspapers, periodicals, &c.

Thus each regiment has, or will soon have, an institute within itself, managed by the non-commissioned officers and men, under the general supervision of the commanding officer, where men may occupy their leisure hours in profitable reading or in harmless amusements, free from all irksome restraint, and subject only to such regulations as are absolutely necessary for the maintenance of good order and respectability. Already the system has been entered upon with much spirit by many regiments; and where accommodation cannot be afforded, great anxiety is evinced to obtain the means of establishing the system.

The rules for recreation rooms form part of the code for the regulation of libraries, which will be found in Appendix XV., No. 1.

It has not yet been determined by the Secretary of State for India whether the system of garrison libraries and recreation rooms shall be introduced in that country. Regimental libraries are common in regiments serving in the East: but as a mixed system of garrison and regimental libraries at home stations would be productive of great inconvenience and confusion, His Royal Highness the Field Marshal Com-

manding-in-Chief has ruled, that regimental libraries will not be sanctioned with corps returning from India.

Connected with this subject the Council have to mention "Institutes." One of these on a large scale was established at Chatham in 1862. It contains a library, reading and refreshment rooms, and a theatre. The arrangements are under the supervision of the military authorities. All the corps composing the garrison (with exception of the Royal Engineers) are required to support this institute out of the funds supplied by the annual grant.

Another institute of a special description has been opened at Aldershott. It is called the "Aldershott Mission Hall "and Soldiers' Institute," and has been founded by private individuals "for the purpose of providing religious instruc- "tion, combined with moral and social recreation, for the "soldiers and working classes of Aldershott and its neigh- "bourhood, and also for improving the condition of the wives "and families of both classes by instruction and employment "in needlework."

The list of recreation rooms in Appendix XV., No. 3, is brought up generally to the 31st March 1864. It comprises all those established in Great Britain and the Colonies (excepting India), from which the following particulars are deduced:—

58 corps have two recreation rooms.
103 corps have only one recreation room.
12 use the library for all purposes. These are marked with the letter "*L.*"
4 corps have not yet established a recreation fund.
69 corps supply refreshments in the recreation rooms.
40,801 soldiers subscribe to the recreation rooms.

The report by Mr. Maynard before alluded to embraces the recreation rooms of the Royal Horse Artillery and the Cavalry Depôt at Canterbury. It gives an account of the management of these rooms, the scale of subscription, the furniture, newspapers, periodicals, and the average attendance of the men. It states that of every five soldiers on the strength of the Artillery Brigade, three are subscribers, while in the Cavalry Depôt the proportion is still more favourable, as two out of every three men contribute to the support of the rooms, and the daily attendance in both cases is very good; results which may be greatly attributed to the interest taken in the institution by the officers, the comfortable nature of the accommodation and furniture, the large supply of popular games and light literature, and the efficient service of the refreshment bar.

XIX.

Schools in India.

An Annual Report by Lieut. G. Jacob, upon the Army Schools in the Bombay Presidency, which will be found in Appendix XVI., was received after the proof sheets of the above had been printed. The document is especially valuable as being the only Report of the Army Schools in India, that has reached the Council since 1861. Unfortunately, however, by making his inspections during the cold season, when the troops in that country are most actively engaged in field duties, or in reliefs, the Acting Superintendent found most of the adult schools at their lowest numerical condition; some indeed being altogether closed.

The education given in the adult schools is reported to be generally of the most elementary nature. There are, however, some special exceptions. In the school of the 72nd Highlanders the men study Grammar, Algebra, Trigonometry, including heights and distances, and Geography. In that regiment it is understood, no private is promoted to lance corporal until he obtains a fourth class certificate. There was also a Hindustani class, in which a prize was given by the commanding officer. Several of the men showed a very fair knowledge of the text book used at the examinations for officers and civilians; and some men had already passed in the colloquial examination.

The schools of the A battery 18th brigade, Royal Artillery, Hyderabad, elicited the commendation of the Acting Superintendent.

The school of the Sappers and Miners at Poona, is of a superior order; the men are instructed in surveying, drawing, levelling, the making and preparation of building materials (a most valuable and important branch of knowledge in India), and in the native language. Plane trigonometry and a little engineering are also taught to the more intelligent and industrious pupils.

A "central Artillery School" is also spoken of at paragraph 113, in which a superior education appears to be given, and from which the Artillery schools obtain schoolmasters; but the locality of this school is not mentioned.

Grown Children's Schools.

These appear to afford the Acting Superintendent more satisfaction.

Separation of the sexes is the rule under sanction of a general order, and the necessary consequence is, that the girls receive a very inferior education. Officers commanding

regiments are, however, invested with authority to modify the rule.

Lectures.

The only return of lectures given to the troops is that of the 72nd Highlanders, and no other lectures are alluded to in the Report.

Libraries.

The only libraries mentioned in the Report are those of the A battery, 18th Brigade, Royal Artillery, and of the 72nd Highlanders, both of which are said to be well supported.

In concluding their Report, the Council think it will be seen that the efforts which have now for several years been made for the improvement of the position of the soldier and of his family, have had upon the whole satisfactory results as respects education, and also as regards that difficult but most important question of the employment of the soldier in his hours of leisure. That more, very much more, has not been done in respect to education, is not to be ascribed to any deficiency in the staff of teachers, nor, it is believed, to any unwillingness generally on the part of the pupils, but to those multifarious duties which occupy the time of the soldier, and make his attendance at school both infrequent and irregular. A way of meeting this great difficulty, and at the same time of leavening a whole corps with sound and useful education, has been suggested above at p. xvi., namely, by the formation of special classes, and the Council feel no doubt that by such a plan it is in the power of any commanding officer to provide within his corps a large body of sufficiently educated men from among whom to select non-commissioned officers, and thus to enable the school to work in the most direct manner towards the efficiency of the regiment.

(Signed) F. W. Hamilton, Major-General,
Vice President.
F. Abbott, Major-General.
H. Moseley.
T. Elwyn, Colonel.
J. E. Addison, Colonel.

13, Great George Street,
1st October 1864.

Postscript.—A General Order promulgating the scheme, referred to at page xv, for the better classification and in-

spection of Army Schools; the instructions on this head to superintending schoolmasters, which have received the approval of His Royal Highness the Field Marshal Commanding in Chief, since the Council's Report was printed; and the amended instructions which the Council have issued to the assistant and local inspectors, will be found in Appendix XVII.

APPENDIX.

APPENDIX No. 1.

Memorandum by the Council of Military Education.

1, Whitehall Yard, S.W., 31st July 1861. App. I.

The Council of Military Education have the honour to report, for the information of His Royal Highness the General Commanding in Chief, that in compliance with the instructions contained in the War Office letter of the 4th February 1861, transmitted by the Military Secretary on the 6th February 1861, they addressed the letters annexed marked A. to the Assistant Inspectors and Local Inspectors of Army Schools, and those marked B. to some of the most experienced of the first-class schoolmasters, through the general or other officers in command, whom the Council also requested to state their opinion on the subject in question whilst transmitting the replies of those schoolmasters.

Subsequently the Council considered it desirable to supplement the information thus obtained by an inquiry into the method followed by the Assistant Inspectors in conducting their inspections of schools. A copy of the letter of the Council is appended, marked C. The letters and reports received in reply from the several officers and 1st-class schoolmasters are herewith enclosed. They are paged for convenience of reference.

The Council proceed, in accordance with their instructions above quoted, to submit their opinion on some of the more important points of the educational system referred to in these reports, arranged under the following heads:—

1. The general superintendence of the schools.
2. The system of inspection; duties of Assistant Inspectors; local superintendence.
3. The appointment, pay, and pension of schoolmasters. The soldier assistants in schools.
4. The attendance of adults at schools.
5. Adult school fees; adult school classification.
6. Lectures to troops.
7. Religious instruction in schools.
8. Schools for grown children and infants, and industrial schools.
9. The training and appointment of schoolmistresses.

I.—The General Superintendence of Army Schools.

The suppression of the office of Inspector General, and the transfer of Army Schools from the Secretary of State for War to the Commander-in-Chief, and to the more immediate superintendence of the Council of Military Education was a measure long contemplated, and its adoption was only postponed to March 1860, in consequence of the insufficiency of the office accommodation till that time possessed by the Council for the large increase of business it would entail. Objections are offered* to

* P. 42, &c.

N.B.—The references in Appendix I. are made to the Council's First Report on Army Schools.

App. I.

this change by Captain Gleig, Assistant Inspector of Army Schools, on the ground that the duties are essentially such as "can only be efficiently "performed by an individual devoting his whole attention to them;" and that a committee is in its very nature incompetent for duties of inspection; while such duties are an indispensable portion of the office of the central superintending authority, in whatever manner the latter may be constituted. And Captain Gleig proceeds to recommend the return to the office of Inspector General of Schools, adding to it that of Deputy Inspector General for the assistance of the Inspector General both in the work of the office and of inspection.

The Council are so far from coinciding in these opinions, that they consider very considerable advantage is derived from an inspection of schools conducted by the different members of a body possessing facilities for subsequent comparison and discussion.

It is undoubtedly of importance that the undivided attention of an individual officer should be given to the schools, and this has been in a great degree attained, and probably as nearly attained as in any former period of the school management, by the mode the Council have adopted of carrying on this portion of their duties, viz., by entrusting it to one of their members, who, with the concurrence of the Vice-President, transacts all the ordinary business, reserving only those cases in which an important principle may be involved for the consideration of the Council.

The Council are, however, of opinion with Captain Gleig, that the reports of subordinate officers ought not to be the sole means of obtaining information possessed by the Council, and that their members should have the power of personally examining from time to time the state of the schools.

In answer to their inquiries on this subject, in the summer of last year, it was stated* that it was not intended that the Council should inspect, the Assistant Inspectors being expressly appointed for that purpose. As, however, the inspection of the schools by the Council might be desirable in the first instance,† authority was given for the necessary expenses for that year only, and accordingly the schools of Scotland and Ireland were visited by two of their members, and the Council have experienced ever since the benefit of those inspections.

The Council take this opportunity of renewing their former recommendations on this subject,‡ for the consideration of His Royal Highness the General Commanding-in-Chief and the Secretary of State for War, and of stating their conviction that if they were empowered to make annual inspections of the army schools in the United Kingdom, each member taking a separate district or division, the general system of superintendence as at present arranged ought to be amply sufficient, but that without such powers the Council must remain in great measure dependent on the opinions formed by the Assistant Inspectors on all practical subjects connected with the schools.

II.—Inspection of Schools, Duties of Assistant Inspectors, Local Superintendence.

Whatever may be the final decision respecting the *occasional* inspection of army schools by the Members of the Council, there can be no doubt that a regular periodical inspection and examination of every

* War Office Letter of 26th July 1860.

† War Office Letter, 30th August 1860, $\frac{50}{\text{Gen. No. } 281.}$

‡ Memo. of 3rd August 1860.

school is essential to the efficiency of the educational system. This duty is performed by "Assistant Inspectors" at home, by Local Inspectors at Gibraltar, Malta, and Corfu, by an Assistant Inspector in the Madras Presidency (an appointment recently made by the Indian Government), and by "superintendents" of army schools in Bengal and Bombay, the latter being schoolmasters with Indian commissioned rank of captain.

The Duties of the Assistant Inspectors have never been very accurately defined. It appears that great difference of practice exists with respect to the mode in which the inspections are conducted, one inspector visiting the schools in his district three or four times in a year, another twice, and another apparently visiting them at irregular periods.

Again, one inspector considers four hours and a half sufficient for the inspection of a large garrison school, while another requires for the same purpose from one to two days. The Assistant Inspectors report to the Council on the Form enclosed, marked D, which although entering sufficiently into detail as respects the number of scholars, is too indefinite for any practical conclusions to be drawn from it, as regards the extent or the precise nature of the instruction imparted.

Before proceeding to recommend the regulations which appear to the Council desirable, in respect to the duties of the inspectors, the Council must make one observation, which in a variety of forms is constantly recurring in the enclosed correspondence, namely, that the main-spring of the efficiency of any regimental school is to be found in the countenance and support afforded to it by the commanding officer. Where this is freely given, the measure of improvement is only limited by the circumstances in which the regiment may be placed, and by the capabilities of the schoolmaster; where it is withheld, the best schoolmaster can do but little. It follows that the greatest care must be taken lest the Assistant Inspector should seem in the least to supersede the several commanding officers in the responsible control and management of the schools.

The work of the inspector should, on the contrary, have for one of its principal objects the assistance of the commanding officer, by affording him the most precise information of the state of the schools of the regiment under his command, with such suggestions as the inspector's knowledge of the educational system, and his extended experience, may enable him to offer.

His first object in detecting and exposing the failings of the schools, is to raise the general standard of their instruction and discipline, and this can only be done effectually by the aid of the commanding officers.

After a mature consideration of this subject, in which the Council have had the benefit of the great experience of their colleague, the Rev. Canon Moseley, formerly one of Her Majesty's inspectors of schools, and have been favoured also with information by the Secretary of the Committee of Council on Education, of the mode in which inspections are conducted in the schools under Government grant, the Council recommend the following course, which if sanctioned by His Royal Highness and the Secretary of State for War, they would direct the Assistant Inspectors at once to adopt:—

1. The Assistant Inspectors to make tours of inspection throughout their districts twice in every year.

2. The Assistant Inspector to give to the commanding officer at least a fortnight's notice of the date at which he purposes (if convenient to him) to visit the schools, libraries, reading and lecture rooms. To transmit at the same time forms to be filled up in duplicate, and signed by the schoolmaster previous to the inspection, giving all the statistics of the schools necessary to be known by the Inspector. (The object of this

App. I.

is to enable the Inspector, 1st, to examine the state of the schools more effectually than he otherwise could, by means of the statistical knowledge thus preliminarily afforded him, and 2nd, to enable him to give his whole time, when at the school, to examination and inspection.)

3. On arrival, the Assistant Inspector to take the earliest opportunity of calling on the commanding officer, and learning from him any points he would specially desire to be inquired into or noticed in the school. It would be very desirable that the commanding officer should at some stage of the inspection personally attend, in order to afford it his countenance and aid: but in any case, an officer interested in the schools, and made acquainted with the commanding officer's wishes in respect to them, should accompany the Inspector.

4. To furnish the Council with definite and reliable facts as to the state of the Army Schools, the Inspectors should propose to the adults attending them a set of questions of (as nearly as may be possible) the same difficulty.

To effect this a certain type of questions should be placed in their hands previous to each tour of inspection, to which they should conform as nearly as possible in the questions actually set.

The actual examination of the adult, grown children, and infant school, should last at the least one day; and the next day the Inspector should, with the aid of the schoolmaster and soldier assistants, examine the papers, the school being closed for the day, for this purpose.

The Assistant Inspector would then furnish the commanding officer with the tabulated result of the examination, in the following or some similar form:—

Number of adults on school books_____.
Number present at the examination_____

NUMBER of ADULTS present at the EXAMINATION:—

Who can read at the most			Who wrote from Dictation the 100 Words on the accompanying Examination Paper (with number of errors).					Who worked correctly the Sums on the accompanying Examination Paper numbered									
Letters and Monosyllables.	Easy Narratives.	Books of General Information.	0	0 to 5	5 to 10	10 to 20	20 to 30	1	2	3	4	5	6	7	8	9	10

Signature of Schoolmaster,
Confirmed. (Signed) _____
Assistant Inspector.

The Assistant Inspector to offer at the same time any observations that may be necessary on the other subjects taught and on the general state of the school. If possible, he should deliver his report to the commanding officer personally, and give any explanation that may be required.

5. The Assistant Inspector to forward to the Council before he leaves the station a duplicate of his report to the commanding officer, together with the form containing the statistical information prepared by the schoolmaster, and his own observations on the state of the schools, the efficiency of the teachers, and the result, so far as necessary, of his interview with the commanding officer.

It is of course essential that all the men whose names are on the school books, and who are not absolutely required for duty, should attend on the day of the inspection. To ensure this, as well as some of the other duties above detailed being practically carried out, it may be necessary to introduce a clause into the next edition of the Army School Regulations on the subject of inspection, should His Royal Highness approve of the foregoing recommendations by the Council.

In addition to the inspections, which only occur once in six months, it is essential at large stations, such as Aldershott, Dublin, the Curragh, &c., to provide for a local system of superintendence, by means of first-class schoolmasters, who act under the immediate directions of the general officer in command.

This system has in fact grown out of the necessity of the case, but hitherto there has been no recognition of it in the Army School Regulations. The Council are of opinion that the status of such schoolmasters should be officially laid down, and that in consideration of the value of their past services, as well as of the importance of their present duties, they should receive commissioned rank as superintending schoolmasters, with pay as at present, and that their pension should be regulated on the same principle as that of quartermasters.

This question will be further considered in a subsequent part of this Memorandum.

It is here sufficient to state that in addition to their general superintendence of the garrison school, they should give at least one day in every month to each regimental school in the camp or garrison, and that they should report the result to the commanding officer of the regiment, on forms provided for that purpose, forwarding a duplicate of the report to the general officer in command, who would transmit it, with his own observations, to the Council.

These reports may be made very valuable, as they alone can represent the progress of the pupils, the necessarily long intervals between the visits of the Assistant Inspectors causing that, in many cases, they do not see the same men at two successive inspections.

III.—The Appointment, Position, Pay, and Pension of Schoolmasters.

It will be remembered that according to the present system there are two modes by which a candidate can become an army schoolmaster. By the first he obtains as the result of successful competitive examination an appointment as monitor in the model school of the Royal Military Asylum (being then from 16 to 18 years of age); and after serving as such for two years, is enlisted as schoolmaster, and is usually attached as assistant to a garrison or depôt battalion school, under the supervision of a first-class schoolmaster; and after serving in that capacity for a period of (usually) about two years, he returns, if the reports of his conduct and efficiency are favourable, to Chelsea, and undergoes a course of instruction of one year, or one year and a half, in the normal school, and of six months' further practice in teaching and lecturing in the model school, when, if reported fit, he is appointed army schoolmaster of the third class.

By the other mode admission is obtained direct to the normal school at Chelsea by competitive examination, without the preliminary course

App. I.

of pupil-teaching and assistantship in army schools; candidates must be between the ages of 19 and 25 years. The examination is open to civilians and to non-commissioned officers not below the rank of full corporal, and they must be unmarried. Those who are successful remain for a year and a half in the normal school, and then receive instruction for six months in the method of teaching and lecturing in the model school, after which, if reported fit, they are recommended to the Commander-in-Chief for the appointment of third-class schoolmaster.

The pay of an assistant schoolmaster is	-	2*s.* 0*d.*	per diem.
That of a third-class	-	4 0	„
„ second-class	-	5 6	„
„ first-class	-	7 0	„

Promotion from one class to another is according to merit.

Promotions have hitherto been accelerated by successive augmentations, but when the establishment is complete the proportions as at present fixed of one-tenth of the whole consisting of first-class, two-tenths of second-class, and seven-tenths of third-class schoolmasters (thus leaving more than two-thirds of the establishment in the lowest class) will no doubt shortly render promotion as slow as it has, up to this point, been rapid.

In the reports now under consideration there appears to be no material difference of opinion with respect to the efficiency of the schoolmaster thus trained for performance of the duties entrusted to him.

With respect, however, to the regimental position of the trained schoolmaster, some of the opinions expressed will not be found equally satisfactory.

He is represented as occupying an isolated and ill-understood position, being neither officer or non-commissioned officer, neither identified with the regiment by personal friendship nor by *esprit de corps*;* as not subject to the same salutary influence as non-commissioned officers, who have to look to the regimental authorities alone for reward and advancement; as unused to habits of discipline;† as ordinarily too young, on first appointment, for so responsible a position;‡ and as being less fitted to deal either with officers or men that if he had served some time in the ranks.§

The schoolmasters are also stated, as a class, to show little appreciation of the moral responsibilities attaching to their position. They are represented as in some cases "regarding their duties too much in the light of "a mere trade;" ‖ "as repudiating any responsibility with respect to "the conduct of the children" ¶ of the regiment otherwise than in school, and as failing to train them sufficiently in habits of politeness and deference to their superiors in age and position.**

It is to be feared there is too much reason for some of these observations. At the same time, the Council are of opinion that they are mostly remediable, either in the natural progress of the system, or by effecting such modifications in it as may meet the defects complained of. There appears to be, however, one serious evil for which it would be difficult to find any immediate remedy, namely, the extreme isolation of the position of the trained schoolmaster. This results, no doubt, in part from the high pay he receives, being 6*d.* a day *at first joining* more than that of the serjeant-major of infantry; partly also from his distinctive dress, resembling, it would appear, too closely that of an officer: but more particu-

* Major-Gen. Eyre, p. 66. † Ibid., p. 67.
‡ Ibid., also Lieut.-Gen. Sir J. Pennefather, p. 66, and Mr. Wharry, p. 102.
§ Colonel Herbert, p. 58. ‖ Mr. Wharry, p. 102.
¶ Captain Gleig, p. 44. ** Ibid.

larly from the superiority of his educational acquirements over those of his associates.

The true remedy in the latter respect is of course to raise the education of the non-commissioned officers by means of "advanced classes," so as to bring them up to the level of the schoolmaster; and this, it may fairly be anticipated, will, in process of time, be effected by the progress of opinion in the army in respect to the value of education as forming good non-commissioned officers, and by the support of the regimental authorities being more and more given to the labours of the schoolmaster.

The promotion of the schoolmaster from a lower to a higher class for merit is practically a matter of much difficulty. As justly observed by Major-General Eyre,* it can only be awarded, especially when abroad, "on the reports of commanding officers whose standard of merit can "never approximate to uniformity;" and merit, as observed by Schoolmaster Rogers,† is often considered to mean interest.

The Council are of opinion that promotion, or rather the increase of pay, which in the case of the schoolmaster it alone implies (since his duties remain the same), would be more fairly bestowed by periodical augmentations of it, taking of course the strictest guarantees that the service performed has been such as fully to merit such increase; in other words, according to absolute, not relative merit, which latter it is so difficult to estimate.

Promotion, however, to the first-class or superintending schoolmaster stands on a different ground. Here the number annually to be promoted is comparatively small, and the duties to be performed are of a higher order than those of the ordinary schoolmaster. The Council therefore are of opinion that such promotions should continue to be awarded on the ground of merit alone; and, to render such advancement an object of ambition to the schoolmaster, as well as to place him on a footing in this respect with other non-commissioned officers, they would submit that the superintending schoolmaster should have commissioned rank and pension‡ similar to that of quartermaster.

Before proceeding to the modifications they would propose in the existing system, the Council must refer to two classes of teachers in the army schools, viz., the fourth-class or assistant schoolmasters, before spoken of, and the soldier assistants.

1st. With respect to the fourth-class or assistant schoolmasters and to the first mode above described of admission to the Normal school at Chelsea, the Council must report that, having carefully watched the working of that system, they are of opinion that the extreme youthfulness of the assistant schoolmasters when sent to garrisons, and the habits they too often acquire in a comparatively unrestrained position, are unfavourable to the formation of that character which is required in a schoolmaster.

The following passage from a letter of the 1st April 1861 from the Commandant of the Royal Military Asylum, conveys a similar opinion:—

"I would strongly recommend that arrangements should be made to obviate the necessity of fourth-class schoolmasters returning here to complete their education, as I find they are generally dissatisfied with the restraint which is necessarily imposed on them when they re-enter the Normal school, and they impart a spirit of discontent amongst the younger students."

The Council are not of opinion that this system should be continued.

2nd. The soldier assistant receives 3*d.* a day extra pay.

He cannot attain any higher rank or pay in the school, and his prospects of advancement, which by reason of his education are often

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* P. 68. † P. 70. ‡ Lord Rokeby, p. 97.

App. I.

considerable, are not improved by his remaining too long as a teacher. The great demand for educated men for the duties of non-commissioned officers tends further to shorten his period of service in the school. In consequence the change of soldier assistants is in many corps so frequent that they have no time to become efficient. This evil is universally complained of in these reports. It is aggravated in depôt battalions by the youthfulness of the soldiers composing them. It is less felt in the Guards and Royal Artillery, where the value of this class is more highly appreciated; and to the superior efficiency of soldier assistants in those corps the high character of their schools is very much to be attributed.

The evidence of the reports under consideration appears conclusive of the necessity of taking some measures to provide a proper supply of this essential element in a regimental school, and the Council propose to effect this by insisting on a certain period of service as soldier assistant as a qualification necessary for permission to compete for entrance to the Normal School, Chelsea.

The following is therefore the scheme of appointment, pay, and promotion the Council would propose in substitution of that now in force, as a means, in their opinion, of meeting many of the difficulties complained of, and of accommodating the school system more nearly to that of the service :—

a. The first mode of appointment above described to cease, and monitorships at Chelsea to be suppressed.

b. Soldier assistants or non-commissioned officers who have at some period of their service performed the duties of soldier assistant for not less than 12 months; civilian pupil-teachers who have completed their apprenticeship; and certificated schoolmasters—to be alone eligible for competition for admission to the Normal School at Chelsea. Age of admission 21 to 25 years.

The period spent at Chelsea to be two years, during a portion of which time the Students will assist in teaching the boys of the Royal Military Asylum, thus supplying the place of the monitors.

c. On leaving Chelsea, the candidate to receive a certificate stating his degree of merit, and to be appointed schoolmaster.

The present classes to be abolished, and a periodical increase of pay substituted, the latter being contingent on the schoolmaster being well reported of by the commanding officers under whom he has served, and by the assistant or local inspectors, and on being recommended by the Council to the Commander-in-Chief.

The pay to commence at 3*s.* a day, and to be increased by 6*d.* a day every two years, provided the above conditions are fulfilled, until a maximum of 5*s.* 6*d*, a day, the pay of the present second-class schoolmaster, be attained.

d. From the general class of schoolmasters the superintending schoolmasters, with commissioned rank, to be selected for merit alone, irrespective of the rate of pay to which, in accordance with the last paragraph, they may have been advanced. The educational attainments of schoolmasters, as recorded on the certificate they receive on leaving Chelsea, as well as the periodical reports received of their efficiency during subsequent years, would form the data on which the selection would be made.

The pay of the superintending schoolmaster to be that which the first-class schoolmaster now receives, viz., 7*s.* a day (or 8*s.* after 10 years' service), and his pension to be fixed on the same principle as that of quartermasters.

The number of superintending schoolmasters to be limited by the requirements of the service, as it will be only advisable to employ them at camps and large garrisons.

The above alterations in the terms of appointment and promotion to be applicable alone to future schoolmasters entering the service, and

to such schoolmasters now in the service as may desire to accept the new conditions.

The present rule with respect to counting former service towards pension, in the case of those who have been soldier assistants, to continue, as also the additional pay of 1*s.* a day after 10 years' service as schoolmaster.

It is also worthy of consideration whether the regulations for the dress of the schoolmaster should not be revised by the proper authorities, in order to remove from it any undue similarity to that of the regimental officers.

In the above recommendations it has been assumed that the principle of paying the schoolmaster at a considerably higher rate than the combatant ranks is to continue in operation. It is presumed that the rates were fixed with the view of attracting well-educated civilians to the school department of the army. The candidates who actually come forward are in nearly all cases pupil-teachers in the National or other schools.

As stated by Colonel Lefroy in his report for 1859, "The generality "of young men who offer themselves as students possess very little "previous education," and the two last examinations for admission showed that in this respect there was but little difference between the non-commissioned officer and civilian candidates, who were placed in the Examination Report as per margin.

Examination of August 1860.			Examination of January 1861.		
Order of Merit.	Rank or Position of Candidate.		Order of Merit.	Rank or Position of Candidate.	
1	Serjeant	Qualified :— 4 Civilians and 3 Military Candidates admitted.	1	Civilian	Qualified, but only 12, of whom 5 were Soldiers, admitted to fill vacancies.
2	Civilian		2	Do.	
3	Do.		3	Do.	
4	Do.		4	Do.	
5	Do.		5	Corporal	
6	Corporal		6	Civilian	
7	Do.		7	Corporal	
8	Serjeant		8	Civilian	
9	Corporal		9	Serjeant	
10	Do.		10	Serjeant	
11	Serjeant			Civilian	
12	Do.		11	- -	
13	Do.		12	Corporal	
14	Corporal		13	Civilian	
15	Serjeant		14	Corporal	
16	Corporal	Not qualified.	15	Serjeant	
17	Civilian			Civilian	
18	Corporal		16	- -	
19	Serjeant		17	Civilian	
20	Do.		18	Do.	
21	Corporal		19	Do.	
22	Do.		20	Do.	
23	Civilian		21	Corporal	Not qualified.
			22	Do.	
			23	Do.	
			24	Do.	
			25	Civilian	
			26	Bombardier	
			27	Corporal	

App. I.

It would certainly seem that with proper encouragement both to schoolmasters and their pupils, the army itself ought to be able to supply its own teachers, and that a competitive examination which should admit candidates from the whole service (the examination papers being sent to all stations at home and abroad) would effectually secure this object.

That the material exists in the army is evident from the fact that at this moment four of the most eminent army schoolmasters, viz., First-class Schoolmaster Grant, superintending the schools at Aldershott; First-class Schoolmaster Barnes, superintending the schools at Dublin; First-class Schoolmaster Newsome, superintending the schools at the Curragh; and First-class Schoolmaster Little, of the depôt battalion, Limerick, were formerly non-commissioned officers.

The data, however, it must be admitted, are not at present sufficient to enable the Council to form a decided opinion on this subject.

IV.—The Attendance of Soldiers at School.

The irregularity of the attendance in the army adult schools is unquestionably the greatest difficulty in the educational system. Could it be overcome, it would scarcely be too much to expect that nearly every man would in process of time be to a certain extent educated; that libraries and reading rooms, which have already done so much to elevate the condition of the soldier and to diminish crime, would produce still greater results; that the enlargement of the field from which non-commissioned officers are selected would result in the improvement of that class on which so much of the efficiency of the army depends; and that the general superior intelligence both of non-commissioned officers and men would exert a perceptible influence on the mode in which the most ordinary as well as the most important military duties are performed.

The present system is one of extreme fluctuation; "one day a large "number attending, and perhaps for the next few days none,"* the average instruction amounting in some cases, as at Colchester,† to one hour and a half per man weekly; in others, as appears by the monthly reports, to less than one hour. It is obvious that the schoolmaster must become disheartened under such a state of things, and that the learner, finding his progress so slow and his first difficulties never really overcome, will be only too ready to give up any further attempts.

Yet it cannot be said that this defect is inherent in the army school system. In some regiments all such difficulties are overcome. Here, indeed, is principally seen the influence of the commanding officer.

It is mentioned in this correspondence‡ that in the 14th and 91st Regiments, the commanding officers of which did not consider that the school should give way to every parade, fatigue, &c.; "nearly all the "men could read and write, many were more advanced, all seemed to "make progress;" and a case is also referred to§ in which, under one commanding officer, the men of a battalion made good progress, but under his successor "those who were commencing to read and write "fairly have almost forgotten what they had learned."

To the same purport the first-class schoolmaster at Aldershott reports‖ that "in some regiments matters are so arranged that studious and "attentive men are enabled to make considerable progress, whilst in "other regiments the result is not quite so satisfactory."

It is therefore a matter for consideration whether what is practised so successfully, and doubtless to such advantage, in some regiments, might

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* Colonel Herbert, p. 58.
† Schoolmaster Savage, p. 72.
‡ Colonel Herbert, p. 57.
§ Ibid. p. 58.
‖ Schoolmaster Grant, p. 65.

not by judicious arrangements be extended to all. But before proceeding further, it is necessary briefly to refer to the past history of this question.

In 1849 the Duke of Wellington issued an order that "all recruits, "until dismissed drill, attend the garrison or regimental schoolmaster "daily, for two hours, to receive instruction from him."

This order continued in force till the year 1857, when it was cancelled by a General Order, by which the commencement of the soldier's education was postponed till he had been dismissed drill; and as it was ruled that a soldier could not legally be compelled to attend school, the order was limited to the encouragement to be given by commanding officers to their men to attend. Subsequently a clause was introduced into the Articles of War empowering commanding officers to order school parades, and their attention was called to this power in the General Order of the 23rd February 1860, but a subsequent General Order, that of the 16th January 1861, appears to have been interpreted by some commanding officers as "forbidding them under any circumstances to "exercise the powers of compelling attendance at school conferred upon "them by a clause of the Mutiny Act," while by others it has not been so interpreted, as is evident from the following passage in the letter enclosed of Major-General Ridley, which represents, perhaps, the more correct view both of the state of the present regulations on the subject and of the present practice: "I am convinced," he observes, "that "where commanding officers exercise the power judiciously of compelling "the attendance at school of young soldiers, and affording older men in "the service the opportunity of doing so by exempting them from "parade, when such indulgence can be granted without detriment to the "good of the service, crime and irregularity in quarters are considerably "decreased."*

The state of things above described cannot in any way be deemed satisfactory. A large expense is incurred by the public for the education of the soldier, but it evidently depends in a great degree on the personal feelings and opinions of each commanding officer whether the outlay shall, in the body under his command, secure any corresponding result.

That excellent results are attained in some regiments proves that, where there are no exceptional circumstances, they ought to be attained in all. The question, therefore, arises to what extent, if any, commanding officers should be directed to avail themselves of the power conferred by the 37th Article of War to compel attendance at school.

This question seems to depend on the further question whether the school is merely an adjunct, or whether it is, on the other hand, an essential part of the regimental system in time of peace. Now it is argued with much force in some parts of this correspondence that the altered conditions of war, consequent on the introduction of improved fire-arms, require a far greater development of intelligence in the soldier than before was necessary; and this appears to be confirmed by the extreme care now bestowed on rifle instruction, including, as it does, not merely the mechanical teaching formerly held to be sufficient, but also lectures requiring a certain educational attainment to render them at all intelligible.

"A soldier," it is said, "who does not know his alphabet, is told that "the course of the bullet, under the influence of powder, is a curved line "called the trajectory, and this is done in a school-room with black "board and easel,"† and with diagrams and written explanations which must be incomprehensible to a wholly uneducated mind.

As a less direct, but very important, argument to the same effect may

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* Major-General Ridley, p. 74.

† Mr. Sargeaunt, p. 6. *See also* Colonel Lacy, p. 12.

App. I.

be stated the diminution of crime referred to by Major-General Ridley (above quoted) as an almost certain consequence of the ability attained by the soldier to avail himself of the libraries and reading-rooms now so liberally provided for him.

The Council would submit that these reasons point clearly to the conclusion that the ability at least to read and write has become an essential part of the requirements of the soldier in time of peace. In war, circumstances may of course render the suspension of such requirements necessary, in order to give more time to the more urgent military training of the recruit.

The Council, however, fully admit that it would be inexpedient to compel old soldiers to attend school, nor would they propose that the attendance even of soldiers dismissed from drill should be made compulsory. Indeed, the principle of compulsion is practically inapplicable from the moment the soldier is dismissed to duty, as the constant recurrence of duties and fatigues must always render such attendance extremely desultory, and often useless.

The Council would therefore recommend,—

1st. That recruits shall not be dismissed to duty until able to read and write. A discretion, however, might be left with the commanding officer with respect to any occasional instances in which a man might be found absolutely unteachable; and it should of course be also left to his discretion to remit the recruit's attendance in the earliest stage of his drill. The weekly attendance should not be less than six hours.

2nd. That means should be taken to impress on commanding officers the necessity of giving to every duty soldier who *voluntarily* attends school the opportunity of attending at least four hours each week, in accordance with the General Order of the 19th June 1857. For this purpose it is suggested that a statement how far that order is carried out in respect to the voluntary classes, should be required in the confidential reports transmitted to the Adjutant General.

3rd. That it should be also stated in the confidential reports to what extent the system of school certificates, as conferring eligibility for promotion, is carried out in accordance with the same order.

The Council are of opinion that the very limited degree of attainment here proposed to be exacted, coupled with the measures suggested to increase the degree of encouragement to voluntary education given by commanding officers, would in no long time cause a perceptible advance in school instruction, attended by the valuable collateral results before spoken of, while the common objections to compulsory education would not be applicable to what is in fact but a preparation for the professional instruction of the soldier.

V.—Adult School Fees.—Adult School Classification.

The abolition of school fees in 1857 for adults under instruction in reading, writing, and elementary arithmetic, and the further abolition of fees in 1860 for adults in the third class who have entered on the study of grammar, history, and geography, have in the opinion of the Council been attended with very beneficial results.

The total abolition of such fees is strongly recommended in some of the enclosed reports, and appears to merit a careful consideration.

Colonel Lefroy states in his published Report: "There are great difficulties in maintaining payment for the more advanced classes when the primary class is free. Payment so regulated acts as a tax upon progress, and I feel it my duty to suggest, concurrently with the establishment of a legal power to order attendance at school, under proper regulations, the total abolition of school fees for adults."

Major-General Lord Rokeby observes* that, "the majority of adults "cease to attend school as soon as the moment arrives when they are to "be advanced into the second class, from which fees are exacted. Many "of them return at a future date, after they have been promoted to the "rank of corporal, in order to acquire the degree of knowledge which "will render them fit for the duties of pay-serjeants, but the interval "which has taken place renders their subsequent advance more diffi-"cult, and in some cases determines men to take their discharges at the "expiration of the first period of enlistment rather than go through the "training necessary to prepare them for these important duties."

The writers in the enclosed correspondence, who refer to this subject, recommend almost without exception that the fees from the higher class shall cease to be required.

There can be little doubt that the discontinuance of attendance at school as soon as the scholar is prepared to enter the class in which fees are exacted, is very general.

Out of 100 schools, taken at hazard, it appears from their monthly school reports that only 18 have any pupils in the paying classes.

The amount per annum received by the public from the paying classes will of course be known at the War Office.

It would seem that it cannot be very considerable, and it becomes a serious question whether it is at all an equivalent for that bar to progress which a partial exaction of fees undoubtedly tends to create.

To the recommendations of the Council in their Memorandum of the 17th April 1860 for the discontinuance of school fees, it was replied,† that though the education gratuitously afforded might be further extended to the third class, it could not be admitted that the Government were bound to provide the soldier with instruction in the higher branches of knowledge.

Whilst fully acknowledging the force of this reasoning so far as respects the obligations of Government in regard to the education of the soldier, the Council would submit that it would nevertheless be very desirable to discontinue the exaction of school fees from the higher classes.

There cannot be a doubt that at present the whole school suffers by the withdrawal of its more instructed classes, and the consequent low standard of acquirement placed before the pupils. One great incentive to improvement is thus removed, and further, there ceases to be that encouragement to exertion which should be engendered by the feeling "that it is the desire of those in authority that instruction should be "carried to the furthest extent practicable."‡

There is also an indirect effect of the partial retention of school fees which must be noticed, viz., the necessity of drawing a strict line of demarcation between the paying and non-paying classes.

If all entered the school equally ignorant, this might be of little consequence; but, in point of fact, men are necessarily put in the same class who have very different degrees of attainment: the man who can read and write fairly, but who is ignorant of arithmetic, is put in the same class with those who cannot read at all. This of course can be partially remedied by the schoolmaster himself, but much greater results might be expected, if, as suggested in this correspondence, the men could be

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* P. 96.

† War Office Letter, 17th May 1860, $\frac{50.}{\text{St. Helena.}\ 11.}$

‡ Captain Gleig, p. 33.

App. I.

"placed in different classes for instruction in different subjects, so that "they might be able to work together in those subjects."* If the school fees were discontinued, the present exact system of classification, which hampers the masters' efforts for the progress of individual soldiers, might be considerably modified, if not altogether dispensed with.

Upon these grounds the Council would strongly urge a reconsideration of the former decision on this subject, being satisfied that the results of the total abolition of school fees would more than compensate for the sacrifice, especially when the large sum willingly bestowed by the public on the education of the soldier is taken into consideration.

VI.—Lectures.

It is perhaps premature to attempt to judge of the results of the system of lectures which has within the last few years been introduced. It may be expected that accounts will vary much from different stations, according as the schoolmasters at those stations may or may not have a natural gift for lecturing. But upon the whole, the reports in favour of the system greatly preponderate, and all that the Council feel called upon to suggest at the present time is that every encouragement should be given to any competent lecturers, as officers, chaplains, &c., who may be willing to undertake the task, as well as to schoolmasters, and that a circular, at the commencement of the winter season, conveying the desire of His Royal Highness, that commanding officers should use their utmost endeavours to promote the success of the system by obtaining such assistance, would probably have a very beneficial result.

VII.—Religious Instruction.

The Council have carefully considered the regulations on this subject, and are not of opinion that any alteration in them is desirable.

VIII.—Schools for Grown Children, and Infant and Industrial Schools.

In the reports under consideration there is a general concurrence of opinion in favour of the children's schools as now conducted, and while the testimony is very seldom to their disadvantage, in the generality of cases it asserts for them a superiority, as compared with the ordinary National schools.

Without venturing to express an opinion upon this question, the Council must observe that the general result, which is so much more favourable than any that can be claimed for the adult schools, is beyond doubt due to the comparative freedom of the children's schools from the one great defect of the former, namely, the irregularity of attendance.

One exception, however, to this general statement must not be overlooked. Major-General Eyre states,† in his note on the margin of First-class Schoolmaster Rogers' report, that "the soldiers much prefer the "system of civilian schools, because they consider our system to aim at "more than is useful to their station in life.

"They complain of reading, writing, and figures being neglected for "geography, history, &c."

This complaint is of course not new; it is in fact repeatedly urged in some cases with, but very frequently without, just grounds against the whole National school system.

If there be any such defect in the teaching of reading, writing, and figures, it is one for which the visits of the Assistant Inspectors ought to

* Captain Gleig, p. 44. † P. 68.

afford an easy and sufficient remedy, and by directing their special attention to this point, the Council trust that it will cease to be any subject of complaint. At the same time much caution is necessary in treating this question, lest by laying such great stress on the more elementary subjects (which are freely admitted to be the essentials) geography, history, and other subjects whose tendency is to awaken and enlarge the intellect, should appear to be undervalued. The statement in question shows at least the necessity of every inspection being accompanied by a searching examination, and followed by a very minutely detailed report, as already recommended.

The opinions stated in the enclosed correspondence are generally in favour of the remission of school fees from childern, the extreme poverty of the parents being usually the reason alleged. The parents are represented as in some cases sending their children to civilian schools,* where the fees demanded are less; and it is observed that "the remission of "the fees would be a great boon to the men and but little expense to "Government."†

On the other hand it is contended,‡ that "knowledge to be paid for "is more prized by that class than were it perfectly free," and that when no charge "was made the battalion school occupied a lower place in the "estimation of the parents than the humblest of the paid-for schools "outside the barracks."

The practice of the National schools is also strongly in favour of this view.

The Council have felt it their duty to notice this question, as it is brought rather prominently forward in some of the enclosed reports, but they are not at present prepared to suggest any alteration in the existing regulations on this subject.

An opinion stated by Colonel Egerton in favour of regimental as distinguished from garrison schools, and to some extent concurred in by Major-General Ridley and by Lord W. Paulet, in a letter received from him in September last, deserves consideration. It is remarked§ that in the former "a better supervision can be had, and the schoolmasters "identify themselves more with their work, and know their pupils. "This is especially observable with respect to the children's and infant "schools. Many officers also, and officers' wives, would take an interest "in a regimental school, who do not like to interfere in a garrison "school." Major-General Ridley admits that this is the case,‖ and that in consequence regimental schools are more easily conducted, and are very often superior to garrison schools; but he considers that, "after "all, this is an imaginary difficulty, for the services of officers and their "wives, which at all times may be most valuable, can be easily bestowed "without in any way trenching on the rules laid down by the War "Office."

As, however, in a garrison school, the children of all the regiments attending are mixed in the several classses, the Council apprehend that this must ever be a serious obstacle to the voluntary attendance of regimental officers and their wives; and the Vice-President of the Council states that this was in fact the result of the garrison school system in the division under his command at Aldershott.

It must be admitted that the regimental system, with the feelings of interest it calls forth in the officers and ladies connected with a regiment on behalf of the soldiers and their children, cannot fail to be in a great degree obliterated by the more general system of garrison schools, and

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* Captain Gleig, p. 33.
† Colonel Herbert, p. 58.
‡ P. 98.
§ P. 79.
‖ P. 75.

App. I.

the evident absence of such interest will inevitably be accompanied by the defect in the training of the children, before noticed, to habits of politeness and deference to their superiors.

Against these disadvantages is to be set the undoubtedly superior progress attainable in large and well classified schools, such as a garrison shool may and ought to be. If limited to a few of the largest stations, they may be made model schools of instruction and discipline. A regiment being quartered for a time at one of such stations would have its children's school merged in the garrison school, and much good may result both to the schoolmaster and schoolmistress, and to the children, by this process, if not continued so long as to withdraw the children altogether from the supervision of their proper teacher, and from the interest of the officers of their corps.

Upon the whole the Council are of opinion that while it will not be prudent to disturb the present arrangements at Aldershott and other large stations where garrison schools have been built, it will not on the other hand be desirable to extend the garrison school system below the largest camps or garrisons, as Aldershott, Dublin, &c., as it can scarcely be said to be in harmony with the regimental system of the army.

Of the industrial schools little need be said. They are admitted on all sides to be most beneficial in their operation.

It were much to be wished that they could be extended to the instruction of boys in tailoring and shoemaking, as suggested by Major-General Sir R. Dacres,* and the Council strongly recommend this subject for consideration.

Were this measure carried out, the time at present devoted by the schoolmaster in the afternoon to the boys' school might with great advantage be bestowed on a class of adults, thus reducing the numbers of men attending at a time, and giving more scope to the schoolmaster's attention to individuals. It may be added that evidence adduced by a committee on the late Commission on Popular Education goes far to show that a reduction of this nature effected in the hours of ordinary instruction would not be attended with any diminution of the rate of progress of the pupils.

IX.—Schoolmistresses.

1. Home and Colonial Training Institution, London.
2. Wesleyan Normal Training Institution, London.
3. Dublin National Society Training Institution.
4. Glasgow Free Church College.
5. Edinburgh National Training Institution.

The conditions of appointment of schoolmistresses are detailed in Article 48 of the School Regulations.

The applications for the office are very numerous.

The applicants are in many cases daughters or widows of persons formerly non-commissioned officers in the army. They are trained at the schools named in the margin.

The period of training for unmarried candidates is, in the Home and Colonial Institution, one year, and in all the other institutions six months.

The earliest age of admission to the training institution was formerly 18 years, but the Council have in practice raised the age to 20 years, so as to ensure that the schoolmistresses shall, on joining the army, be in general not less than 21 years of age.

This, however, still appears too young when the peculiar position of the young schoolmistress in a regiment or garrison is fully considered;

* P. 99.

and the Council therefore endeavour to limit the appointments as far as possible to candidates of more advanced age. Whilst however every possible precaution seems necessary on this point, the Council are happy to record that no instance of immorality has been reported since they have had the superintendence of the schools.

It is to be feared that in many cases the education of schoolmistresses previous to entering the training institution has been of a very inferior order.

There would appear to have been always found some difficulty in providing adequate security, by means of a reliable preliminary examination, for the sufficiency of their attainments. It has been the practice to confide this duty to any chaplain or schoolmaster who might be in the neighbourhood of the candidate, and whose report appears to have been accepted as final. It is to be apprehended that in too many cases the report was made rather out of charity for the particular candidate than in the interests of the public service. First-class Schoolmaster Earp,* writing from Malta, reports, that "some schoolmistresses whom he had "met, though qualified for industrial instruction, were barely able to "read and write, and could not make out the simplest return or requi-"sition intelligibly or without errors in spelling;" and to the same purport Colonel Herbert† states that "few of the schoolmistresses who "had come under his notice appeared to understand the system, or to "be capable of imparting instruction in such a manner as to be of any "great benefit to the children."

As the Council require the examination papers of the candidates to be forwarded for their inspection, it is hoped that no such cases of incompetency as those above referred to will recur. It seems evident indeed that to the want of a sufficient guarantee in the preliminary examination is to be traced much of the deficiency in question, from the fact that since the Council required the production of the examination papers they have had occasion to reject candidates for ignorance of the most elementary branches of knowledge, who had nevertheless been pronounced by their examiners to be competent.

But although absolute inefficiency may be thus provided against, the question still remains whether the present is the best mode of providing a supply of competent schoolmistresses for the Army.

On this point Lord Rokeby‡ observes, that "the period during which "girls are kept at the Normal school is scarcely sufficient for the "acquirement of sufficient instruction for the duties they are subse-"quently called upon to perform, and I have heard of instances in "which they have been found very deficient. Their youth often "renders it no easy task to maintain their authority. If married "women, the wives of serjeants, could be found who were duly in-"structed, they would probably experience less difficulty."

Captain Gleig§ proposes a scheme for the training of schoolmistresses by means of model schools established at one or two large stations, at which candidates for the office would act under carefully selected head mistresses as assistants, at salaries of 10*l.* or 12*l.* a year.

It appears to the Council very desirable to obtain, where possible, the services of the wives of non-commissioned officers, and they think that by the plan proposed by Captain Gleig such persons might receive a sufficient degree of training, though not probably equal to that imparted at the regular training institutions.

But they could not recommend any extension of that scheme, beyond the training of wives of non-commissioned officers, as it would obviously

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* P. 94. † P. 58. ‡ P. 96. § P. 38.

App. I.

be attended with serious risk to collect a number of young unmarried women in a large camp or garrison, where it would be extremely difficult to find for them adequate protection.

In all that Captain Gleig represents of the insufficiency of the educational staff for large infant schools, the Council fully concur. It is scarcely possible for any one person to undertake the instruction and control of 40 children in different stages of progress, and it would appear in ordinary cases a safer rule to call in the aid of the pupil-teacher when the number of pupils exceeds 20 or 25 at the most.

With regard to the present regulations for the appointment of pupil-teachers, the Council are of opinion that some alteration is desirable. It is found to be practically impossible to secure the services of efficient pupil-teachers whose age must not be less than 15 years, at the low rate of remuneration offered, viz., 4*l.* per annum. The difficulty, however, might, in the opinion of the Council, be met, so far as regards the regimental schools, by the introduction of a younger class of teachers as "monitresses," who might be eligible for that appointment at 13, and be required in all cases to give it up at 17 years of age.

The monitresses to be appointed, with pay at 4*l.* per annum, whenever the number of children in the infant and industrial schools exceeds 25, and for every subsequent 25 an additional monitress, except when, as will be afterwards explained, it may be considered desirable to appoint the wife of a non-commissioned officer as assistant schoolmistress.

The monitresses should be appointed on the examination of the Assistant Inspector. They should be taught by the master with the other children for an hour and a half every morning, and the schoolmistress should see that they practise sewing at home in the evening. They should be examined by the Assistant Inspector whenever he visits the school, and reported on specially.

The children in regimental schools are usually very young, and it is a matter of ordinary experience that girls of the ages above stated may be most usefully employed in aid of the schoolmistress, in the instruction and control of the infant school.

The Council would propose to reserve the appointment of a higher class of instructor, to be called "pupil-teacher," to large garrison and depôt battalion schools, in which there are ordinarily girls to be taught of more advanced age.

At the stations where such schools have been established there are usually many families of old non-commissioned officers and soldiers, from which, if the inducement held out were sufficient, a supply of well-qualified persons could be obtained; while as the latter would remain under the protection of their parents, the main objection to Captain Gleig's plan would not here apply.

The lowest age on appointment to be 17 years, instead of 15 as at present.

The remuneration the Council would propose to be fixed at 6*l.* for the first year, which amount to be increased by 3*l.* each year, till it attains a maximum of 18*l.* A pupil-teacher therefore, who obtained her first appointment at 17 years of age, would receive the maximum rate of salary at 21 years of age, when she would be eligible for admission to a training institution, and subsequently for appointment as a trained schoolmistress.

The Council have recommended that where the children of a school exceed 25 in number, a monitress should be appointed. They would also recommend that where the number of children in the infant and industrial schools exceeds 50, it should be allowed to employ the wife of a non-commissioned officer, who should be certified by the Assistant or Local Inspector to be fit for such duty, as assistant schoolmistress.

The pay to be on the same scale as that above recommended for the grade of pupil-teacher.

The assistant schoolmistress to be eligible for promotion to regimental schoolmistress, on a vacancy arising, by undergoing a course of training at a training institution or in a large garrison school; receiving in the latter case, before being appointed, the certificate of the Assistant or Local Inspector of Schools, that she is equal to trained mistresses on grounds of education and practice in teaching, in accordance with Article 48 of the School Regulations.

The above sources of supply of army schoolmistresses, viz., the class of pupil-teachers and of assistant schoolmistresses, will be highly useful as supplementary to the present supply from the training institutions; and it is hoped that by the aid of the former it may be possible to limit the selection of the candidates generally to persons of more advanced age and experience.

The additional expenditure that would be incurred by this extension of the system of pupil-teachers would in the opinion of the Council be amply repaid in the superior efficiency of the infant school, which, it must be remembered, is the germ of the "grown children's" school, and on which the latter greatly depends.

The Council are not aware of any further passages in the enclosed correspondence which call for remark. The complaints relative to copy-books, which are very frequent, were last year anticipated by the Council; but the improved books have only recently been issued, and the writers were of course in general unaware of the change which had been sanctioned. The same remark applies generally to the observation on the educational books. The complaints of the want of accommodation are not new. The increase of accommodation must be the work of time; but until a reasonable amount of room be afforded in each barrack, it is impossible to expect at all stations satisfactory results from the school system.

Whether the school system as it exists at present gives results equal to the great cost at which it is maintained, is a question to which it would be very difficult to find a satisfactory answer. In some stations and in some regiments the results leave very little to be desired, and without doubt amply repay the cost. But at others the case is very different. All that can perhaps be said at the present moment is, that the balance is probably in favour of the system as against the expense. The Council trust that the measures they have proposed will, if they meet the approval of His Royal Highness and of the Secretary of State for War, have a powerful influence in favour of education, by inducing commanding officers, on whom everything in this case depends, to support and encourage the system.

This can only be effected by investing more completely the authorities in garrisons and regiments with the responsibility which properly attaches to them for the efficiency of the schools, and then by giving as free play to their efforts as the regulations will admit of; a line of action which is certainly practicable and efficacious without any derogation to that control which belongs to the head-quarters of the army in this as in every other department.

W. Knollys, Lieut.-Gen., V.P.

There is much in this Report to which I cordially consent; but there is much in it to which I object. See my reasons annexed. } J. E. Portlock, Major-Gen.

Henry Moseley.

T. Elwyn, Colonel.

J. E. Addison, Lieut.-Col.

App. I.

Council of Military Education, July 31, 1861.

I regret that I cannot express my entire concurrence in this Report, though there is much in it of which I cordially approve.

1. In the first place, the alteration in the proposed mode of paying schoolmasters appears to me objectionable. By lowering the pay on appointment, it lessens the motives for competing for the appointment, amongst civilians, and this in the end would lower the tone and ability of army schoolmasters The old system has raised to the position of schoolmasters some of its best masters, from the army, and the number of competitors is every day increasing. By lowering the pay at starting the motive for competing will be diminished; civilians will be discouraged from competing, and soldiers of a lower degree of attainment will be encouraged to compete; the same class of candidates will not be induced to come forward from the civilian class, and the general standard of qualification will be lowered.

2. Another objection to the proposed scheme is that the rise from 3*s.* to 5*s.* 6*d.* per diem will become a mere matter of routine, as it is now proposed to carry it into effect. Much will be reduced to the habit of yielding to the wishes of both the commanding officer and the commanding officer's wife, and thereby endeavouring to gain their good opinion, rather than by a strict adherence to the rules laid down for the guidance of schoolmasters. The fact that they might jog on for 10 years before they would become qualified for the next and most important rise, would be a discouragement of men of qualities and education of a superior mind.

3. This evil might in some degree be guarded against by making the pay on appointment higher in proportion to qualification. Thus, at the last Chelsea examination, one candidate was very superior to all the rest, and it would be very injudicious to merge him amongst all the rest. Suppose, then, that there were grades of pay proportionate to merit in the first instance, this man would then receive 4*s.* or 4*s.* 6*d.* on first joining, and become qualified for promotion to the officer class in six or in four years.

4. I next object to the discredit thrown on the system of garrison schools. I have myself visited them, and quite concur with Mr. Vicars, one of the Assistant Inspectors, in thinking that the school system would be materially injured by doing away with or by curtailing them. By mixing the children of several regiments in the same school emulation is excited among the masters as well as the scholars. In the regimental school many defects of manner and arrangement will pass unnoticed; but when the master and scholars are brought in competition, with a superior master to watch over them, they are at once discovered and corrected.

5. There is no reason why the commanding officer of a regiment, or his lady, should refrain from visiting the school. Surely it ought to be a greater matter of pride to witness the superiority of their own children and of their schoolmaster, than to be satisfied by thinking them so, without trial.

6. The depôt school resembles in many respects the garrison school, and should be placed on the same footing. Any great diminution of such schools would be very injurious, if not fatal, to the system.

J. E. Portlock, Major-General.

A.

Sir, 11 February 1861.

I am directed by the Council of Military Education to forward the annexed copy of a letter received from the War Office, and to request that you will have the goodness to furnish the Council with the information therein required.

I have, &c.
(Signed) D. Greentree,
Captain and Secretary.

The Assistant Inspector
of Army Schools,
&c. &c.

B.

Sir, 11 February 1861.

I have the honour, by direction of the Council of Military Education, to request that you will cause the annexed copy of a letter received from the War Office to be placed in the hands of Schoolmaster of the under your command; and in forwarding his reply the Council request you to favour them with any opinions you may have formed, from your own observations, of the working of the present army school system, either in respect to existing defects or to improvements which might be made in it.

I have, &c.
(Signed) D. Greentree,
Captain and Secretary.

The Officer Commanding

C.

Sir, 3 April 1861.

With reference to my letter of the 11th February I am directed by the Council of Military Education to request you to furnish them with information upon the following points connected with the duties of assistant inspectors :—

1. Are periodical inspections prescribed by the rules of your office, and if so, at what periods?
2. Have you in any respect modified these rules either as to time or number of inspections?
3. What time is expended on a tour of inspection?
4. What time is usually occupied in the inspection of a large, medium-sized, and small school respectively?
5. What is the average number of *special* visits to schools you have been required to pay annually?
6. Please to describe in the fullest detail your mode of conducting an ordinary inspection.
7. Do you give official notice in all cases of your intention to inspect, or do you at any time visit a school without notice?

The Council will be also glad to receive any further information upon this subject which you may think it desirable they should possess.

I have, &c.
(Signed) D. Greentree,
Captain and Secretary.

The Assistant Inspector,
&c. &c. &c.

D.

W. O. Form 1059.

Report of Inspection of the Schools of
at on the by
Officer Commanding _____

Schoolmaster _____ Schoolmistress _____
Assisted by _____ Assisted by _____

APP. I.

ADULT SCHOOL (distinguishing different Regiments or Depôts).

REGIMENT, RANK.	Effective Strength.	On School Books.	Present.	Effective Strength.	On School Books.	Present.	Effective Strength.	On School Books.	Present.	
Serjeants - -										
Corporals - -										
Lance Corporals -										
Privates - -										
Drummers and Band Boys.										
Totals - -										

The School is held in
Regular hours of attendance

CHILDREN'S SCHOOLS.

	Estimated No. in Garrison.	Grown.		Industrial.		Infant.	
		On School Books.	Present.	On School Books.	Present.	On School Books.	Present.
Boys under 6 years of age.							
Boys above 6 years, under 9.							
Boys above 9 years, up to *							
Girls under 6 years of age.							
Girls above 6 years, under 9 years.							
Girls above 9 years, up to *							

* Insert the age of the oldest boy and girl at school.

Schools, where held
Regular hours of attendance

Remarks on the nature and condition of the school-rooms and buildings, and on the quarters of the schoolmasters and mistresses when not the subject of a separate report; stating whether any of the latter are in receipt of lodging money, or commuted allowance in lieu of fuel and light.

REPORT ON THE ADULT SCHOOL.

State the classification of the school, the subjects in which each class is instructed, the subjects in which it was examined; the general progress and apparent intelligence of the men; the impression formed of the efficiency of the master and assistants; whether music or fortification are taught; whether lectures are delivered; the number, if it can be ascertained, of men in each class who have learned to read and write since enlisting.

Report on Adult Schools, if not concluded on this half-sheet, to be continued on a half-sheet inserted, but not to run on to the next page.

REPORT ON THE CHILDREN'S SCHOOLS.

State similar particulars of the children's schools. Add the nature of the industrial instruction, whether any ladies of the regiment interest themselves in these schools, with the approval of the commanding officer. Name any promising elder children capable of becoming monitors or pupil-teachers. The impression formed of the mistresses.

ADDENDUM.

App. II. No. 1.

The attention of the Council has been called by Earl de Grey to the table inserted by the Council of Military Education in their confidential memorandum on Army Schools of 31st July 1861, page 4. His Lordship's object in so doing was, he stated, to enable the Council to correct any misapprehension that might exist on the tendency of this table to cramp the energies and limit the progress of students under an examination restricted apparently to the three subjects of reading, writing, and arithmetic.

The Council deem it necessary to explain, therefore, that such an interpretation would be most foreign to their views.

They are desirous, and will take every means in their power to insure the ability and zeal of the teacher being instrumental to the proportionate advancement of the learner, an advancement which should only be limited by the thorough and progressive knowledge of the subjects studied.

Their object is to stimulate the exertions of the master by requiring from him details not only of the progress of his pupils in the prescribed subjects, but in all others of the ordinary subjects of elementary instruction, leaving open to him every opportunity, whether in the marginal column for remarks or in his more general report at the end, where space will be left for that purpose, to bring before the eyes of the Council of Military Education and the superior authorities the result of his instruction and the progress of his pupils.

(Signed) W. KNOLLYS, Lieut.-Gen., Vice President.
J. E. PORTLOCK, Major-Gen.
HENRY MOSELEY.
J. ELWYN, Colonel.
J. E. ADDISON, Colonel.

13, Great George Street, 3rd April 1862.

APPENDIX II.—No. 1.

From Major GLEIG, Royal Artillery, Assistant Inspector of Army Schools for SOUTH BRITAIN.

1. The following general report upon the Army Schools stationed in the Southern District during the past year is founded upon the inspection reports transmitted by me to the Council of Military Education during the same period, in accordance with the provisions of paragraph 17 of the "Instructions for Assistant Inspectors of Army Schools."

2. The table of results of the examinations of adults in reading, spelling from dictation, and arithmetic has been compiled from the tables at the foot of the first page of the Inspection Reports (Form D). The men reported to read letters and monosyllables at most were unable, when examined in my presence, to read anything more difficult than "Jones's Early Secular Lesson Book." Those reported to read books of general information read fluently in my presence the "Supplement to the Fourth Reading Book," the most advanced pieces in the "Third Reading Book," and other pieces of about equal difficulty. Those reported to read easy narratives are of very various degrees of attainment. Some of them are but little more instructed than the men reported to read monosyllables, whilst others might almost have been returned in the highest class of readers.

The improper use of capital letters in the exercises written from dictation has been reckoned as mis-spelling, and it is probable that nearly a fourth part of the mis-spellings noted were of this kind, but I have no record of the precise number. The piece dictated was commonly selected from the "Sequel to the Second Book."

App. II.
No. 1.

3. Table of Results of Examination of Adults.

Rank.	Number that read at most			Total examined.	Number that wrote 50 Words with mistakes as below.				Total examined.	Designation of Examination Paper.	Number that worked correctly Sums, on Forms B. and C., numbered								Total examined.
	Letters and Monosyllables.	Easy Narratives.	Books of General Information.		0	1 to 5	6 to 10	11 and over.			1	2	3	4	5	6	7	8	
Non-commissioned Officers - -	2	125	474	601	69	292	133	102	596	Form B.	303	216	132	128	224	148	55	49	603
										Form C.	130	100	78	25	46	16	16	16	
Acting Non-commissioned Officers, Privates, and Drummers, &c.	635	1,153	1,489	3,277	174	780	441	489	1,884	Form B.	964	542	324	301	576	258	88	147	1,890
										Form C.	398	311	192	65	110	81	40	48	

4. As the above table shows only the number of absolutely correct answers given by pupils examined in arithmetic, I think that no correct inference as to the arithmetical attainments of those examined can be drawn from it; but from what I have seen of the examination papers, I believe I am justified in reporting that the compound rules are very imperfectly understood by many men who are supposed to be acquainted with them, and that the rule of practice is not generally taught in the schools. I have found comparatively few men able to work sums in the compound rules, except as applied to money. Many are unacquainted with the tables of weights and measures in common use, and a still greater number appear incapable of applying them to the working out of sums.

5. In six schools men have been brought forward by the schoolmasters for examination in history of England and geography, and in nine others for examination in geography only. But questions on both subjects have been set in the schools generally to those men who received the higher examination paper, according to the instructions of the Council. The results of the examinations have been in most cases of the poorest description. The only exceptions to this which I think it necessary to specify have been in the Depôt Brigade of Artillery at Woolwich, the school of which is conducted by Mr. Thacker, and in the 78th Highlanders, the school of which is under the management of Schoolmaster Fleming. The Depôt Brigade school is one of those in which history and geography have professedly been taught, and the 78th school is one in which geography only has professedly been taught. But it is to be observed that a large proportion of the men reported fit for examination in geography, in some schools even the majority, did not receive the examination papers on this subject because they were not sufficiently advanced in arithmetic.

7. In all cases in which the recommendations of the Council for the establishment of special classes have been thoroughly carried into effect the progress of those attending them has been very satisfactory. But it is to be regretted that few commanding officers have carried them out to the full extent of ensuring the attendance of men at school for at least three hours daily, and allowing them to take their guards and other necessary duties together on one particular day of the week.

8. The number of men who have learnt to read and write in army schools, if it could be ascertained, would afford one valuable test of the usefulness of these establishments; but there are no means at present of acquiring precise and reliable information upon this point. The mere reports of the schoolmasters do not give it, for different masters take widely different views of that which constitutes learning to read; and carefully kept records of progress are to be found only in a very small number of schools, and even in those relate usually to only a few men, and extend over short periods of time. Nevertheless there are instances of such records having been kept, and I see no reason why they should not be kept generally and systematically. Without precise instructions as to the manner of keeping them, which should ensure uniformity of practice among the schoolmasters, they would be of little use.

9. I have received very few unfavourable reports of schoolmasters from commanding officers or others, either in respect of their conduct or of their ability and attention to their duties. The inspections, as now conducted, do not afford inspectors the opportunity of seeing the schoolmasters teach, and the schools engaged in their ordinary work; and the examinations by paper do not appear to me to furnish data on which to found an opinion of the merits of schoolmasters. If, indeed, they could be fairly supposed to show the results of the masters' teaching, they would furnish such data to a certain extent; though in any case it would

App. II. No. 1.

be necessary that an inspector should know how many times each pupil examined had been in school, over what period his school attendances had been distributed, and what he knew when he joined the school first. As things are at present managed the examiner has no means of knowing whether the work done by the pupils in his presence is really the index of what they have learnt in the regimental schools, or whether it shows only how much they have not yet forgotten of that which they had learnt at some period before they joined the service. It is only in a very few and peculiar cases that he can know whether a schoolmaster is a good teacher of an adult class, and a good manager of an adult school, or not.

10. In the great majority of the schools of grown children which I have inspected, the pupils have appeared to possess fair, but not superior, intelligence for their years and station. Reading, writing, and spelling have been successfully taught in most schools; but the number is somewhat less in which arithmetic has been thoroughly well taught, and I think it right to repeat the expression of my opinion, given more than once in former reports, that most masters push on their pupils too fast in the study of this particular subject, and that the regular and systematic revision of that which has been learnt is not generally practised. A thorough knowledge of the tables of weights and measures in common use should be more generally inculcated than it is in our schools.

11. The knowledge of English history possessed by the pupils in most of the schools which I have inspected is very small.

12. The knowledge of geography is somewhat greater, but I think there is a want of system in the teaching of it. In one school the children are presented for examination in the geography of England, in another for examination in that of Europe, and in a third they are perhaps reported competent to answer questions on that of Turkey or India. But they usually know nothing of any branch of the subject except that one in which they are presented for examination by the schoolmaster. I think it would be better to take the various parts of the subject in one regular way in all the schools, and as the pupils made progress in the study of it, to revise from time to time those which were the earliest learnt. The text books are arranged with a view to its being taught in this way, but I have seldom seen such a system carried out in practice.

13. Most of the chaplains in the district in which I inspect have assumed a certain control over the schoolmasters in respect of the religious instruction of the children, according to the provisions of the new school regulations. I hear satisfactory accounts from them of the working of the new system, and I am most happy to report that I have heard no chaplains speak in other than approving terms of the manner in which the schoolmasters have co-operated with them in carrying on this part of their duty.

I have heard a larger proportion of good Bible lessons, and a smaller proportion of bad, or even indifferent, ones given by schoolmasters during the past year than in any previous one. The Bible lessons given by the schoolmistresses too have been better, upon the whole, than formerly, though there is still room for improvement in many cases.

14. The number of really good object lessons that I have heard given by schoolmistresses has not been large. On the other hand I think the teaching of arithmetic in the infant schools has improved.

15. I have observed a great improvement in the past year in the manners and appearance of the children present at the inspections. How far it has extended itself beyond the precincts of the school-rooms I am not in a position to say. But it may reasonably be hoped that the habit of self-control and politeness in school is not altogether without

an influence upon the children when they are elsewhere. At any rate the improvement, so far as it goes, is undeniable, and it is creditable to the teachers by whose exertions and attention it has been brought about.

16. My reports of the qualifications of the schoolmasters and the schoolmistresses and their assistants, have for the most part been favourable during the past year, and in very few instances indeed have they been absolutely unfavourable. I regret that the business of testing the accuracy of the schoolmaster's return on Form A. leaves an inspector very little time for observing the master in the management of his school, and his assistants in that of their several classes.

17. The schools are still almost universally without inclosed playgrounds. This is a great pity, and at the camps, if nowhere else, it might surely be remedied. The infant schools especially should have them. Though ever so small they would be of great use.

18. Many infant schools are still without a proper supply of suitable pictures, picture alphabets, and boxes of form and colour, all of which are very necessary appliances in infant school teaching. In many of the masters' schools inconvenience is reported to have been felt from the cutting down of the requisitions for foolscap paper, dictation and copy books, and reading books.

19. The irregularity of the attendance in adult schools and the frequent changes in those of children are still much complained of by the teachers. Both evils are great, and both are to a great extent unavoidable in army schools. Indeed the latter, arising mainly from the circumstance of parents receiving their discharge from the service and from the frequent reliefs of detachments, cannot possibly be prevented. But I think that the bad effects which result to the schools would to a great extent be obviated by the introduction of a different system of classification from that now almost universally adopted, under which pupils (whether adults or children) should be arranged in different classes for the study of different subjects. This seems a more natural and effective method than that, now commonly practised, of teaching the same set of pupils in the same class in all their various subjects of study, no matter whether their acquirements are equal in all subjects or not. Whether it be considered a good system for schools in general or not, it is well adapted, in my opinion, to those of the army, because the impossibility of keeping a given set of pupils at one common level of acquirement, which results from the irregularity of their attendance, would not interfere with the due instruction of the whole in the classes for which their respective attainments might fit them. I have seen such a system in use in a school of grown children. It was worked without difficulty, and it produced the best results. I have never seen it in an adult school, but I entertain not the smallest doubt of its practicability or of the goodness of the results which might be expected from it.

(Signed) A. C. Gleig,
Assistant Inspector of Army Schools.

App. II. No. 2.

Appendix II.—No. 2.

From E. A. Vicars, Esq., Assistant Inspector of Army Schools for Ireland.

Sir, Trimbleston Lodge, January 11, 1864.

I have the honour, in accordance with the instructions of the Council of Military Education, to forward herein my annual report of the condition and progress of the schools in this district.

The disproportion between the number on school registers and the actual daily attendance.

The difficulty with which the schoolmaster has always had to contend in his instruction of adults, viz., a regular attendance, for a certain number of hours a week, remains to be successfully surmounted. The daily average of soldiers, who are to be found in the majority of the schools in this district, does not bear a proper proportion to the number enrolled in the registers, and the amount of time given, in the case of those who do attend, is so small as to render it idle to look for any substantial results. There are, of course, exceptions to this state of things. At Limerick, for example, and at Belfast, a reference to the monthly report for November last will show that facilities are given and inducements provided in those battalions for a regular attendance of soldiers at school, which have raised the daily average to an approximate ratio to the numbers on the books. In the case of Limerick the daily average attendance for November was 345, out of a nominal aggregate of 488: whilst at Belfast the numbers registered are 198 as against a daily attendance of 99. Some of the more striking instances of the disproportion to which I refer are as follows:—

Exceptions to this state of things.

Templemore.

At Templemore the master is reputed to have in charge 240 pupils, of which he saw no more on the average each day in November than 85, and that for a period of less than two hours in the week.

Athlone.

Similarly at Athlone, the number on the school books for November was 174. The average daily attendance was 60, and the hours per week of instruction were, of the serjeants, one hour; of the corporals, two hours; of the privates, 4·5 hours; and of the drummers two hours.

The 84th Regiment furnishes another illustration of this disparity. The names on the roll amount to 558, and the daily average attendance was 51, and the hours per week of each man were, of the serjeants, ·32, corporals, ·38, privates, ·40, and drummers (who attend with the boys as well as with the men), 2·75.

Fermoy.

At Fermoy, the school ostensibly consists of 276, and there were present each day in November on the average 113; whilst the hours per week of the several ranks were, serjeants, ·0, corporals, 2·04, privates, 2·79, drummers, 4·93.

These examples will sufficiently show the remarkable disproportion to which I advert, but the following statistics may be added, in corroboration of the general proposition.

Total of numbers on school books in November 1863.

The number of soldiers of all ranks on the school books in Ireland in November last were, in round numbers, 4,828, whilst the average daily attendance was 1,817.

Total on school books for December 1862.

Taking the month of December 1862 for the purpose of comparison, I find that the number of men of all ranks on the school books was 5,360, whilst the average daily attendance was 2,169. These figures show that the names on the school registers have fallen from 5,360 to 4,828, or a difference of 532; whilst the daily average attendance for November 1863 is less than that for December 1862 by 352, the totals being 2,169 as against 1,817.

Proceeding with the analysis of these data I find that in December 1862, of the entire number who form the daily average of 2,169, there were, in round numbers, 71 serjeants and 202 corporals. The total for November 1863 is thus composed:—Serjeants, 57, corporals, 156, drummers, 308, privates, 4,307, in all 4,828.

Division into ranks of the total of December 1862.

Selecting the month of March 1863, which forms the junction between the periods most favourable and least favourable to the attendance of adults, I find, in round numbers, that there were present daily on the average 75 serjeants, 247 corporals, 263 drummers, and 1,764 privates, in all 2,349. The numbers enrolled at this period were 5,643.

Return for March 1863.

The returns thus, for these months are as follows:—

December 1862.

On school books - - - -	5,360
Daily average attendance - - -	2,169

March 1863.

On school books - - - -	5,643
Daily average attendance - - -	2,343

November 1863.

On school books - - - -	4,828
Daily average attendance - - -	1,817

Causes of the disproportion.

The disproportion between the nominal roll, and the actual daily attendance, as also the reduction of the hours in the week, which are spent in the school, may be attributed to several causes.

Indifference of the soldier.

The indifference of the soldier to learning as a labour, additional to his ordinary duties, is, of course, one of the principal difficulties to be overcome. As a rule, the adult, who has arrived at man's estate without any but the most elementary knowledge, does not appreciate the advantages of education in the abstract. If he perceives that those who know, or are striving to learn what he has not yet been taught, and is making no effort to acquire, are in possession of palpable benefits, in which he has no share, such, for instance, as eligibility for promotion, occasional exemptions from parades, &c. &c., an appeal is made to his judgment in favour of going to school, which he will not often or long resist. The abolition of all fees has removed one serious stumbling-block in the way. The adult has no longer to pay for instruction to which he may be entirely indifferent, and which he can only attain by sacrificing some of the time he has been accustomed to regard as his own. But then on the other hand, as there is no cost involved in being registered in the school books, men give in their names who have no intention of attending regularly if they can avoid it.

Abolition of school-fees; its effect on this disparity.

Promotion made contingent on certain attainments.

As to the inducement of promotion, it is only right to state that it is not as yet made sufficiently contingent upon a certain reasonable amount of learning, and assuredly not to the extent contemplated by the Horse Guards' Order, No. 686, of the 29th June 1857, one paragraph of which states that, except in the field, "no man is to be considered eligible for promotion to the rank of corporal who has not been dismissed "the above class," that is, who is not sufficiently advanced in reading, writing, and arithmetic. That order is not fully acted upon; were it generally enforced in its integrity, soldiers with ambition and capability would find themselves provided with a stimulus to learning and a bias in favour of education, for which no other motive, for the most part, would be an adequate substitute.

Indulgences from parades as encouraging adult attendance.

Then there is the question of indulgences, in the form of exemptions from parades and other military duties. The extent to which these may be given must depend, of course, on the exigencies of the service and

App. II. No. 2.

the discretion of commanding officers. But that such indulgences are inducements to men to go to school, and that they do augment numbers as well as promote regularity, is indubitable. Two instances occur to me which sufficiently illustrate the effects of excusing from afternoon drill, say, four times a week, such soldiers as are school-goers.

Limerick.

At Limerick, where this concession, or something like it, is made, there is always a large daily attendance. In the monthly report for December last, I find that 303·15 is given as the daily average attendance, out of an aggregate of 511, and each man had more than three hours in the week.

Cork.

At Cork, where no encouragements of this kind are afforded, the average daily attendance for December was 60·7, out of a total of 209, and it would not appear that the men who were present had even one hour in the week at school.

36th Regiment and its school attendance.

The 36th Regiment, which has recently embarked for India, always had a large adult school whilst it was stationed at the camp at the Curragh, and at a season when the duties are greatly in excess of those which devolve upon troops under ordinary circumstances.

The 86th Regiment and its school attendance.

The 86th Regiment, who were quartered in an adjacent square, had a wretchedly thin and irregular attendance. The difference was attributable to Colonel Hort's keen interest in the progress of education in his regiment, and his consequent exemption from afternoon parade of men who were going to school, who were marched there and a strict register kept of their attendance. In the 86th no such inducements were given, and the result was such as might have been expected.

The interest of commanding officers of vital importance.

The interest of commanding officers in the work of education has a most material influence upon the progress of adult instruction in a regiment. It is not too much to say that where the colonel is himself anxious for the improvement of his men, one of the principal difficulties which retard that improvement has been removed. Be the duties ever so heavy and exacting, he will find means to encourage his men to go to school, and although he may not be able, consistently with his military functions, to prevent their doing so under disadvantages and drawbacks, he will nevertheless give the work such sympathy and co-operation as the circumstances will permit. The progress of instruction in such a corps may not be all that could be desired, either in its extent or its rapidity; but at all events real good will be effected, and the standard to be aimed at will be approached if it be not actually attained.

Variety of difficulties and disadvantages.

It is not to be contended, of course, that the advantages of every garrison and regiment are equal, or that their opportunities are uniform in respect to the promotion of adult instruction. In one case, the attractions and gaieties of a town may be the hindrance, in another the number of field days and parades may be the obstacle, in another a want of energy or an unpopular manner or a defective judgment in the master may be the drawback. But it may safely be affirmed that in those depôt battalions and regiments where the instruction of the ignorant soldier is considered a matter of real importance, there will always be something like a regular attendance, and a degree of progress proportionate to the circumstances.

The "special class" system.

The introduction of the "special class" system will not fail to be followed by the most satisfactory results, if the purposes it was designed to subserve are kept steadily in view and the scheme is adopted in its integrity.

Before I proceed to comment upon this subject, a statement of the extent to which the system has as yet been established in this district may be appropriate.

I commence with the month of March 1863, and I find that there were

in existence at that period 22 "special classes," and that the average daily attendance of the men who composed them, in round numbers, was 416. In November 1863, the results are as follows:—

Number of special classes	13
Daily attendance	147

Statistics as to number of special classes and the average daily attendance.

If I am correct in my analysis there are now 17 battalions and regiments in Ireland where no "special class" is in operation, viz., the battalions at Cork and Athlone; the Artillery at Ballincollig, Limerick, and Portobello; the 10th Hussars, 11th do., 15th do., 4th Dragoon Guards, 5th do., and Military Train; the 10th Regiment, 29th do., 58th do., 84th do., and 86th do.

The "special classes" now established are as follows:—

	Average daily Attendance.
4th Hussars	14
45th Regiment	2·90
Belfast	26·90
19th Battalion (Fermoy)	7
18th „ „	4
Limerick	14·24
32nd Regiment	14·90
Birr	6·37
11th Regiment, 1st Battalion	18·5
Buttevant	3·70
Royal Barracks, Dublin	5·45
Templemore	21
12th Regiment, 2nd Battalion	13·25

The number of hours per man in the week.

An examination of the hours per week, which the men who form these "special classes" devote to the school, will show that this admirable system has not as yet had a fair trial. It was originally intended that these classes should consist of picked men, who were, as far as was practicable, and under general circumstances, to be excused from all duty but guards, and that they should all go on guard together. It is obvious that this arrangement is not carried out. On reference to the monthly report for November last, of the 12th Regiment, 2nd Battalion, I find that the number of hours of school attendance per man weekly was 5·15. The returns of some others are added.

	Hours per Week.
Royal Barracks, Dublin, corporals	4·26
11th Regiment, 1st Battalion	1·8
45th „ corporals	·83
„ „ privates	·62
32nd „	5·86

The largest number of hours per week given by any "special class" in this district during this month of November was at Limerick, where the corporals attended 16 hours and the privates 15 hours. In no other case does the number reach 11 hours.

The system calculated to promote adult education.

That this system is admirably calculated to promote adult education in the army, all who have observed its results concur in believing. In the course of my inspections during the year, I have witnessed two or three remarkable examples of its success. Unless an organic change is made in the present state of things, the ordinary attendance of adults, which in many cases does not exceed twice a month, and often is less than that, cannot produce any substantial improvement in the educational status of the soldier. The "special class" system can be adopted in every battalion and regiment with little or no real difficulty, and if,

App. II. No. 2.

when dismissed drill, three or four men per company, selected by the captain, subject to the approval of the commanding officer, were taken off all duty, except that of guards, for the purpose of attending school as often as possible, for as long a time as possible, not only would there always be men fit for promotion, but in a comparatively short period the illiterate soldier would be the exception, and the half-yearly returns of the state of education would show a most marked and unequivocal progress. The success of this system may fairly be said to rest chiefly with commanding officers. If their co-operation is given to it—if their sympathy is enlisted in its favour—no difficulties will ordinarily arise which will not yield no judgment, patience, and perseverance.

The success dependent in the main on the commanding officer.

Children's schools.

The children's schools in this district are in a satisfactory condition. The attendance for the most part is regular. The attainments of some of the senior classes of the "grown children" are very creditable, and the system on which the younger children are taught seems calculated to ensure their being well grounded in the rudiments and taught to understand what they learn.

Singing.

Instruction in singing is more general than it was; but the proficiency attained at present, except in garrison schools like Dublin and the Curragh, is only moderate.

Statistics as to the numbers attending in Dec. 1862 and Nov. 1863.

I subjoin a statement of the number of children, divided into "grown children" and infants, who were attending school in Ireland during the month of November last:—

Grown Children.

Boys	508
Girls	418
In all	926

Infants.

Boys	603
Girls	656
In all	1,264
Making a grand total of	2,190

Against these figures, the numbers attending in December 1862 were:—

Grown Children.

Boys	456
Girls	394
In all	850

Infants.

Boys	515
Girls	564
In all	1,079

Making a grand total of 1,929 in December 1862, as against 2,190 in November 1863.

The conduct of the schoolmasters in this district during the past year has been highly creditable; as a body, they are men of undoubted ability and character.

Schoolmasters and their conduct.

The schoolmistresses appear to understand their work and to be steady and regular; being for the most part trained, they have imbibed correct ideas of system, discipline, and order. As a rule, I do not consider it advisable to place young unmarried women in sole charge of infant and industrial schools. It is questionable, however satisfactory their attainments, if they have that manner of treating very young children which comes so naturally to the mother, and which is so essential to make the little infant happy away from its home and at ease in the presence of those symbols of order and discipline which are connected in its mind with being at school.

Schoolmistresses and their conduct.

Objections to employment of young unmarried women.

Apart from these considerations the position of a young unmarried woman as schoolmistress in a garrison or regiment, especially if she has no family connexion with it, or local associations, is one of some danger and difficulty. To maintain a character above the breath of reproach, is, of course, indispensable, and all her ideas and habits may be consistent with the most rigid decorum and discretion; but nevertheless there are temptations peculiar to her situation, and in cases, fortunately of very rare occurrence, which I have known, they have proved too much for her, and disgrace has been the result. I think it highly important where such women are employed that, if possible, they should be appointed to schools where they will not hold the first place, and that it should be made part of the duty of the senior schoolmistresses to interest themselves in their welfare and report upon their conduct.

Examination by papers.

The system of examination by papers is, in my opinion, a very useful one. It has added to the means of accumulating correct statistics as to the educational status of a school, and it seems also to please the men and to encourage a healthful spirit of rivalry and emulation. In course of time, and more particularly if the "special class" system is generally adopted, we may expect that a very large proportion of adults in a school will be able at least to undertake Form B, whilst many will be equal to Form C.

New library regulations.

The new regulations with regard to libraries have scarcely been in force long enough to enable me to form a very decided opinion as to their working. But so far as I can see, the alteration bids fair to be attended with success.

Recreation rooms.

The setting apart of rooms for recreation is a boon that will not fail to be duly appreciated. To induce soldiers to remain in barracks in the evening, will be a great step towards keeping them from low company and protecting them from intemperate habits. And if to the amusements which are now provided for the soldier within reach of his own quarters, in the library, reading, recreation, and lecture rooms, if to all these sources of healthful occupation and diversion, and acting in confederacy with them, is added a well-regulated system of adult instruction in the school, it is only rational to anticipate that the results to the army will be most conspicuous, as well in the improvement of its morals, as in the development of its intelligence.

I have, &c.

(Signed) Edward A. Vicars.

The Secretary,
&c. &c. &c.
Council of Military Education.

App. II. No. 3.

Appendix II.—No. 3.

From J. P. Sargeaunt, Esq., Assistant Inspector of Army Schools for North Britain.

Tewkesbury Park, Gloucestershire,
December 1863.

Sir,

In presenting an annual Report of the Regimental Schools of the districts under my supervision, I have the honour to submit to the Council of Military Education such remarks on the soldiers' education as have suggested themselves to me during the past year.

New mode of examination.

The order of examination which emanated from the Council, and which was brought into operation at the beginning of the year, entirely changes the test by which schools formerly were tried; and I do not think the change free from serious objection. In arithmetic, geography, and history the examiner has no opportunity of judging of individual intelligence, and a paper examination for elementary schools produces results from which a more unsatisfactory condition than actually exists is likely to be inferred. Men who are accustomed to oral instruction only, and who are as it were in the very birth-throes of education, cannot concentrate their thoughts to the extent necessary to express in writing the slight knowledge they have acquired, whereas by a *vivâ voce* examination it may be ascertained with tolerable certainty whether the men are making any progress in their school-classes, whether their intellect is being sharpened, and whether in cases of marked backwardness, the blame should be attached to the teacher or to the pupil.

Arithmetic.

The plan of examination in arithmetic works badly in two respects. In cases where a few men of a regiment avail themselves of the opportunity of improving an already fair amount of knowledge, it is liable to fail; to some such men the questions are so easy that they work them in a very short time, and then spend in idleness the rest of the time during which the men not so advanced are plodding through the paper. Then again, dividing men into A and B classes only is not a satisfactory test. Those who are reported by the schoolmaster as able to work proportion, but not the higher rules, have the opportunity of answering two questions only. By carelessness in their work they may show no results. If such men had been examined through the elementary rules up to the point in which they had been instructed, a very different conclusion from that obtained would have been arrived at. Thus the test in this subject, arithmetic, one of the cardinal points in a soldier's education, has been during the present year fallacious, and one from which no reliable facts can be deduced. It appears to me that ample means exist through the monthly reports to enable an examiner to apply a real test to the schools without schoolmasters being called upon to say how far and in what subjects their pupils may be examined. Let them be judged by an examination based upon the last sent-in monthly report, and I have no fear but that a satisfactory conclusion would be arrived at, notwithstanding the inference to be drawn, from the present system of examination being ordered, that the Assistant Inspectors are not men of sufficient education to frame questions for this examination of the schools committed to their supervision by the Secretary of State, but are of necessity supplied with skeleton questions and a model form by which to fill up these skeletons.

Next with regard to the examination of those men who are reported as unable to write on paper, my instructions tell me that, having heard them read, I am to dismiss them and proceed with the examination of the rest of the school. Now, I think it will be admitted by all who

have any experience in teaching, that the part of an elementary school requiring most care and attention is the lowest class. If this class be taught in a careless and slovenly manner, without regard to the peculiarities of the individuals composing it, its progress must be slow, and perhaps not more than 10 per cent. of the pupils in it will acquire anything like sound elementary knowledge. Hear what Mr. Little, when first-class schoolmaster at Limerick, says: "Teaching slow, dull, and "careless men is not attractive, and a scrupulous teacher is sorely "tempted to pass them over and give his time to men more ad- "vanced, because with the latter there is less up-hill work." Again, he says, "I superintend the fourth section myself, and hear each of its "divisions a lesson at least twice a week." And again, "Not being able "to place sufficient confidence in the soldiers-assistants (the trained "ones are engaged with the more advanced pupils), is my reason for "giving so much of my time to the junior class. These assistants take "very little interest in the work, and if not well looked after they dis- "courage the learner instead of assisting him." And yet we are now instructed to pass over almost unnoticed this lowest class of pupils, to hear them read monosyllables and be satisfied. I am perfectly aware that an examiner, in endeavouring to get answers to his own questions from such a class, would find himself not understood; but if, instead of trying the impossibility of drawing knowledge from the ignorant, he were to see the mode in which knowledge is offered to them, to satisfy himself that the teachers are efficiently and diligently performing their arduous task, he would be doing more good to the regimental schools than by having paper examinations once a month, and filling the public presses with specimens of soldiers' spelling and writing. I trust, therefore, the Council will see fit to alter the present mode of examination, and allow the Assistant Inspectors to test the schools in such a manner as they may consider best adapted to show the real condition of army education.

Special classes.

Where special classes have been established the most satisfactory results have followed. Their general adoption throughout the army is most desirable. In such regiments as the Cameronians, the 2nd (Queen's), and the 41st, the schools are found to prosper. Every encouragement is given to the soldiers to attend, and to the schoolmasters to do their duty. If the schools of any one of the above-named regiments be compared with those of the 2nd Battalion 25th Regiment at the time of my inspection, which not only received no encouragement, but were actually discouraged by the commanding officer, it will at once be apparent how much depends upon the tone adopted towards them by the commanding officers.

Industrial schools.

I fear, as a rule, little or no supervision is exercised over the industrial schools. The attendance of ladies seems to have become less frequent than formerly. This is very much to be regretted, and I am also afraid that some of the schoolmistresses have an imperfect knowledge of cutting out wearing apparel. I may mention the industrial schools at Stirling and Aberdeen as amongst the best in my district.

The state of the grown children's schools in the army is generally satisfactory, and will bear comparison with that of any similar schools in the country.

It remains for me only to add my belief that the army schoolmasters are zealously and laboriously performing their duties to the best of their ability, and that, as a rule, they deserve every encouragement from those in authority over them.

In conclusion, I beg to remark that in the monthly reports of the schools of the 11th Depôt Battalion at Preston, for October, November,

App. II. No. 4.

and December, no account is given of the conduct of Schoolmaster Carnegie, whilst favourable mention is made of the junior schoolmaster at that station.

I have, &c.
(Signed) James P. Sargeaunt,
Assistant Inspector of Army Schools.

The Secretary to the Council of Military Education.

Appendix II.—No. 4.

Annual Report on the Army Schools at Gibraltar, by Col. F. F. Maude, V.C. and C.B.

Sir, Gibraltar, 23rd January 1864.

In compliance with paragraph 17 of "the Instructions for Assis-"ant Inspectors of Army Schools," I have the honour to submit the following annual report on the schools at this station.

Having so recently (14th instant) transmitted to you a separate and detailed report upon each of the schools in this command, I shall now only generally allude to the following subjects.

During the last year the 2nd battalion, 7th Foot, 2nd battalion, 8th Foot, and the 100th regiment left this command for Malta, and have been replaced by the 2nd battalion, 15th Foot, 2nd battalion, 23rd Foot, and 4th battalion, Rifle Brigade from Malta.

Attendance of adults.

The attendance of adults generally is unsatisfactory, and so seldom that hardly any progress is made by them. The duties of the soldier at this station are severe, and between guards, pickets, parades, fatigues, and employment on public works he has but little time left to himself. The only way, therefore, to enable the soldiers to take advantage of the school, and to improve themselves in education, is to exempt a certain select number per company from roll calls and other ordinary parades, for the purpose of attending school, and to put them on guards, pickets, &c. as much as possible on Saturday and Sunday (non-school days). This is the special class system advocated repeatedly and satisfactorily worked by me when in command of the 2nd battalion, 3rd Foot, in 1860–61, and which system has since been approved of by the Council. In accordance with the wishes of the Council, I have brought this system to the notice of the several commanding officers of corps and regiments at my inspections and on other occasions; but I am sorry to say the Royal Artillery is the only corps now at this station which has a special class. In this corps it works most satisfactorily.

The 2nd battalion, 7th Foot, and 2nd battalion, 8th Foot, had each established a special class before they left this, and with considerable success.

It may not be out of place to mention as a proof of what can be done by a private soldier, who is determined to overcome obstacles, that Private Roach, 2nd battalion, 3rd Foot, in one month when at his duty, attended school 27 times, including night school attendance. This I have already mentioned in my inspection report of this regiment.

Attendance of children.

The children generally attend very regularly, and their progress is consequently most satisfactory.

Commanding officers give every support.

The commanding officers of corps and regiments generally give every support to the schools.

The schoolmasters are generally speaking zealous in the performance

of their duties, and give me satisfaction; their several commanding officers report favourably of them.

Schoolmasters.

Schoolmaster Naylor, attached to the 23rd Foot, arrived here from Malta under arrest for drunkenness. He has since been tried by a court-martial and sent home for discharge.

I regret to say that 2nd-class Schoolmaster Holderness, attached to the 2nd battalion, 2nd Foot, died on the 26th of November last. He was a most respectable, efficient, hard-working man.

Schoolmistresses.

The schoolmistresses generally give satisfaction.

School accommodation.

The following additional school accommodation is urgently required:—

1. An infant school-room for the 1st brigade, Royal Artillery.
2. Ditto for the three companies of Royal Engineers.
3. Ditto for the regiment quartered in Town Range Barracks.
4. An infant school-room for the regiment quartered at the Casemate Barrack.
5. A small school-room for the wing, or head quarters, of the regiment occupying Europa Flats Barrack.
6. The present Royal Artillery adult school-room requires to be enlarged and to be fitted up with suitable desks, forms, &c.; the floor also requires to be boarded.

Libraries.

At present there are two garrison libraries, one at the Casemates Barracks for the North District and the other at the South Barracks for the South District.

With the concurrence of his Excellency the General Commanding, I propose to amalgamate the two libraries into one, a suitable building being provided for the purpose, say, either near the Town Range or South Barracks. The room in the South Barracks at present used as a library is much too small for the proposed purpose. This amalgamation would save the expense of one establishment, and enable the subscriptions of the five regiments of infantry to go towards one library, instead of to two.

A greater variety of books could thus be purchased, as at present duplicate copies of a favourite work are ordered, one for each library.

This plan seems to be the more feasible now that by Horse Guards' General Order No. 823, regiments are ordered to obtain a number of works at one time from the library, and to return them when they require others, by which arrangement the distance of the library from the regiment becomes a matter of little importance when compared with the system of each subscriber having to attend at the library when he required a book.

Recreation and reading rooms.

All the regiments have appropriated some room or rooms of the barracks they occupy as a temporary measure for this purpose; but it is hardly necessary to say they are not suitable. The benevolent intentions of the Government, contained in Horse Guards' General Order No. 823, cannot therefore be fully carried out till an additional room at least is built at each barrack as a recreation room. The eagerness with which the men join these establishments, even when held in rooms indifferently lighted and furnished, shows how much they appreciate any rational provision made for their comfort and amusement. Nothing would be more popular in a regiment than well-organized, spacious recreation and reading rooms, and they tend more than anything I know of to make the men happy and contented, and thereby decrease crime and support discipline.

I can speak from experience on this subject, as in the 2nd battalion, 3rd Foot, which I formed and commanded for four years, I established a reading room soon after its formation, and when I gave up command in 1861 there were 400 subscribers to it.

Lectures.

A series of lectures is now being given by the trained schoolmasters, 12 by each. When these lectures are all concluded, a return of them, according to the form laid down, will be transmitted to you.

App. II. No. 5.

Schoolmaster Holderness, 2nd Foot, was unable to lecture on account of ill-health, and Schoolmaster Naylor, 23rd, from misconduct. The other schoolmasters cheerfully respond to the wishes of the Council in this respect, and in many cases have had large audiences.

School assistants.

Until a better provision is made for these men, their services will neither be permanent or satisfactory. In the majority of cases they are composed of reduced non-commissioned officers, who consequently leave the school as soon as they are entitled by character to advancement in any way.

I have brought this subject to your notice in a former report.

If their condition was improved, and they were in consequence satisfied to remain in the school, there would not be any necessity to have so many of them.

Copy books.

McLeod's graduated series of copy books, Nos. 1, 2, and 3, are not found to answer; the oblique lines puzzle beginners and are of no assistance. The War Office copy books are much better.

A book with alternate copies of large and round hand would be very useful.

I have, &c.

(Signed) F. F. Maude, Colonel,
Local Inspector of Schools.

To the Secretary,
The Council of Military Education.

Appendix II.—No. 5.

Report on the Army Schools at Malta, by Lieut.-Colonel Romer, R.A.

Sir, Malta, 1st January 1864.

Having held the appointment of Local Inspector of Army Schools at this station but a few months, and having only inspected two of the schools of the regiments now in this garrison, and three of these regiments having recently arrived here from Gibraltar, I am not able from my own observation, to furnish to the Council of Education such a report upon the state of the schools as is required at this time.

I may, however, be permitted to offer a few remarks on such points as have come under my notice. As regards the soldiers' children there is a marked difference within the last few years in their general appearance, intelligence, and manners, which may be attributed to the system of Army Schools, and I think the children's parents are beginning to appreciate the advantage of being able to send their children to well and regularly conducted schools.

But notwithstanding the efforts that have been made and the expense which is borne by the country in maintaining these schools, I scarcely think, as regards the adult classes, they have yielded adequate results; nor in my opinion will they, until commanding officers of regiments are led to take a more decided interest in them and a more comprehensive view of what should constitute the making of a soldier in the present day. When a certain amount of knowledge of the elementary subjects of education shall be considered essential towards making a soldier, then the greatest difficulty which the schoolmaster has to contend with in teaching, viz., the irregular attendance of the men on the school books, will be obviated.

The schoolmasters in this garrison bear a good character as regards their efficiency, and have generally conducted themselves very satisfac-

torily; the same may be said of the schoolmistresses, with I believe one exception, which has been reported to the Council.

The state of the school-rooms is good, and they are sufficiently capacious.

The magic lanterns, slides, &c. supplied for the use of the troops are circulating, and short lectures or descriptions of the views, &c. upon the slides are given by the schoolmaster in each regiment. The soldiers take a decided interest in these lectures, and the rooms are well filled. It would be well if schoolmasters generally were called upon to give more attention towards preparing lectures, whether written or *vivâ voce*, that they might be amusing and instructive.

I have, &c.

(Signed) Rob. C. Romer, Lieut.-Colonel, R.A.,
Local Assistant Inspector of Army Schools.

The Secretary of the Council of Education.

Appendix II.—No. 6.

Colonel Lowry's Report on Schools in Canada.

General Remarks.

School attendance is much hindered by the calls and frequent recurrence of duties and fatigues: indeed irregularity of attendance is the one great drawback to the schoolmaster's success; it interferes materially with the progress of classes, and it serves to discourage alike the teacher and the taught.

The question of school attendance is a difficult one, and the opinions of commanding officers will vary as to the relative advantage of enlarging to any great extent the education of the soldier, but, undoubtedly, ability to read and write—which is sufficient for his actual necessities—is a matter of such evident importance as to claim its place in the regular course of military instruction, and to form a well-recognized element of the discipline of the service.

Reading and writing and the multiplication table are not more readily acquired than drill, nor is their acquirement less tedious. I think more time must be regularly set apart for them, if reading rooms and libraries are to prove the attraction and the benefit they are intended, and which their cost deserves.

With an average attendance of scarcely three hours per week for each man much progress cannot be expected. Many men assure me their attendance does not exceed that amount in a *month*. It is greatly to be desired that some arrangement should be arrived at to raise it to a considerably higher figure. The few months during which my attention has been more particularly given to the subject of army schools have convinced me that, till such an arrangement is made—whatever the results in individual cases—the general effect will not be such as might be looked for from the abilities and attention of the masters, and the excellent machinery of the schools.

Soldiers' clubs or institutes, and reading rooms or libraries, which here and elsewhere are every day assuming larger proportions, and being more and more supported by grants from Government, will only find their full development for good when the great mass of the men are better able to read and write with fluency than they are at present. I venture to offer the remark that this object will be mainly attained by the regimental school work being made a more prominent and integral portion

App. II. No. 7.

of a soldier's elementary discipline, and by some plan being adopted for the better training—and longer retention at such employment—of the schoolmaster's *assistants*.

At present these men, though attentive so long as they are retained at school work, and on the whole moderately capable, are, I think, a *weak* spot in the system. Time is required before they are fitted to be really an assistance to the master, and as in some battalions they have to attend two or three parades or marches out per week, they are absent during the only leisure he would have to devote to their special training. Their work is really laborious, and time and pains are required to fit them for it. Too often, when tolerably trained, their services are required elsewhere, or promotion calls them to the ranks again, and they have to leave the school department altogether.

I have, &c.

(Signed) R. W. Lowry,
Lieut.-Colonel, 47th Regiment.
Assistant Inspector of Schools.

Appendix II.—No. 7.

Canada.

Head Quarters, Montreal,
5th January 1864.

My Lord,

I do myself the honour to lay before your Lordship the First Report of the Superintendent of Military Schools in Canada. I have conveyed to Mr. Little my opinion of the careful manner in which he has discharged this duty, and I have caused extracts from the report to be furnished to the several corps concerned.

9th November 1863.

I have, &c.

The Right Honourable
the Secretary of State for War,
War Office, S.W.

W. F. Williams, Lieut.-Gen. Com., B.N.A.

General Report on the Army Schools in Canada, by Superintending Schoolmaster John Little.

Sir,

Montreal, 9th November 1863.

I have the honour to submit, for the information of the Lieutenant-General commanding, the School Inspection reports of the corps serving in Canada.

I shall here add a few remarks, of a general kind, on the instruction given in the schools of those corps.

Adults.

Adult schools.—The subjects taught in these are, reading, writing on copy-books and from dictation, and arithmetic.

The great difference observable between the numbers on the rolls, the average daily attendance, and the numbers present at the time of examination, indicate a very fluctuating attendance. This fluctuation, I was informed, proceeded in a great measure from the men having to attend drill and rifle practice during the summer season, which left them little or no time for school instruction.

Notwithstanding this precariousness and irregularity of attendance, considerable progress is observable in many of the schools.

Grown children.

Some of these schools are in a backward state. The branches taught, generally, are reading, writing, dictation, arithmetic, grammar, geography, history (very little of this), and singing.

Reading. The reading of the higher classes in some of the schools was fluent and intelligent, whilst in others, especially those not having a trained master, it was hesitating, hurried, and indistinct, no inflexion of the voice or change of tone, no matter what the subject.

Writing. Though some improvement in this branch was apparent, yet it is far from satisfactory, many of the copy-books having been hastily written, the style bad, their covers torn or scribbled over, and the pages within disfigured by blots.

Dictation. Writing from dictation, except in a few instances, does not appear to be duly attended to with either children or adults. From specimens I saw I am led to infer that it is irregularly taught, and too much confined to the senior classes.

Arithmetic. In many of the schools this branch is very fairly taught in theory and practice, while in others the pupils are pushed on without regard to the theory or principles on which the rules depend. Its elements, as notation, numeration, and the simple rules, are not sufficiently dwelt upon. Nor do many of the teachers appear to show much skill or inventiveness in the framing of practical questions. I have met with adults and children who had worked the compound rules, quite ignorant of notation and numeration. The blackboard seems to be rather much neglected in such cases.

Grammar. I cannot speak of general proficiency in this branch in very favourable terms; it is taught in nearly all the schools to some extent, and the children of the most advanced classes were able to parse an easy sentence syntactically.

Geography. Geography.—In some of the schools the children acquitted themselves well in this subject, and very respectable progress appears to have been made in the study of it.

Singing. Singing is very carefully attended to in a few of the schools, and considerable progress made; the children being able to sing some of Martin's and Hullah's pieces in parts.

Infant schools. These schools are generally, where there is a trained mistress, fairly managed. Most of the children attending them are very young, with a few exceptions, which will be noticed in the detailed reports.

The subjects taught being limited required little examination, and on reading, writing on slates, and spelling chiefly. They sing a little, but without much regard to harmony. I regret to state that a very important branch of infant education is neglected, I refer to object lessons.

Industrial schools. There is scarcely so much attention paid to this important part of female education as there should be. Some specimens of children's under clothing and stockings were exhibited; the sewing, as far as I could judge, was in many instances well executed, but patching, cutting out, and darning do not seem to be taken up. And yet a knowledge of these portions of industry are of very great importance, indeed an absolute necessity to the rising generation of females.

It does not appear that any ladies interest themselves in these schools.

The schoolmasters of the Grenadier Guards, 62nd Regiment, and 1st battalion Rifle Brigade, have their schools in a very efficient state, and are well worthy of especial notice. I desire also to speak in very favourable terms of the schoolmistresses of the Royal Artillery at Montreal, the 62nd Regiment, and 4th battalion 60th Rifles; and although the latter is not rated as a trained mistress, yet her school is well conducted, as to order and discipline, and in every respect she appears an efficient teacher.

I have, &c.

(Signed) JOHN LITTLE,
Superintending Schoolmaster.

The Hon. Col. Rollo,
Military Secretary, &c.,
Montreal.

App. II. No. 8.

(Copy).

Sir, Montreal, 9th November 1863.

At your desire, and with the permission of the Military Secretary, I supply you with the subjoined abstract of my Report to the Lieutenant-General commanding on the state of the Schools of the Royal Canadian Rifles.

London, Niagara, Kingston, St. John's, C.E., Chambly.

The schools I examined are noted in the margin.

London.—The schools at this station are in a rather low state, the proficiency of the different classes, as ascertained by examination on the various subjects taught, is not of a favourable character.

The schools of all the other stations are nearly on a par. The reading generally being hesitating, burried, and indistinct. Writing is not well taught, the style is bad, and the execution mostly slovenly, and the copy-books kept with little regard to neatness.

Dictation.—Writing from dictation is noted in the programme of studies, but not even moderate proficiency is attained in it.

Arithmetic.—The result of the examination in this branch evinces the want of sustained and methodical teaching of the elementary rules, and too eager a desire to push the pupils forward before they are prepared to advance.

Geography, grammar, history, and vocal music, almost unknown.

As the teachers selected for these schools received no special training, and are not competent for the duties entrusted to them, the state of the schools cannot be other than what it is.*

I am, &c.

J. J. Grant, Lieut.-Col., Commg. R. C. Rifles, London, C.E.

(Signed) John Little, Superg. Schoolmaster.

Appendix II.—No. 8.

Commandant's Office, Woolwich, 21st June 1864.

Sir,

I have the honour to forward to you the enclosed report on the schools inspected by Quartermaster Wharry, R.A., in accordance with the request contained in your communication of the 6th instant.

I have, &c.

The Vice-President of the Council of Military Education, 13, Great George Street, London.

E. C. Warde, Major-General, Commandant.

Memo.

Woolwich, 18th June 1864.

In accordance with the order dated Office of the Council of Military Education, 6th June 1864, the following general report on Army Schools in this district is most respectfully submitted:—

Special classes of adults.

In the reports of school inspection which I have had the honour to forward for the information of the Council during the past year, I endeavoured to bring prominently into notice the clear and evident advantage proceeding from special class instruction as compared with the results of the uncertain attendance at school of duty soldiers generally.

Three of these special classes, numbering in all about 50 men, have been constantly under instruction here during the past winter, the men

* There is no adult school in the Royal Canadian Rifles.

in the two lowest classes being removed from time to time, as they acquired sufficient education to enable them to do their duty properly. The Horse Brigade class was removed at the commencement of the summer drills in April. They had been six months in constant attendance, and they did no other duty during that time. A similar class, belonging to the Depôt Brigade, Royal Artillery, is still under instruction. In addition to the ordinary school subjects, these men have been taught to make out mess and pay accounts; they will go on from this to instruction in problems relative to the lever (handspike) and pulleys, and combinations thereof, with a view to the more intelligent performance of their duties as artillerymen. A lower class is taught in a spare barrack room by a soldier assistant. The schoolmaster visits it occasionally, and the progress made is quite satisfactory; but the case of two young men who began to learn in this class, from a state of almost entire ignorance, affords proof of the extreme difficulty of teaching such men usefully within a reasonable time. The progress of these two men in a given time was exactly ascertained by the schoolmaster, and he did not consider it to be encouraging.

The instruction of the advanced class of non-commissioned officers is continued for twelve months. It is intended to qualify them for becoming acting schoolmasters, and the course of instruction embraces, in as practical a form as possible, all the education necessary to non-commissioned officers of the Royal Artillery, both as regards fitness for the duties of pay-serjeants, and ability to make calculations connected with their ordinary field duties.

Until recently this class has been taught by Serjeant Abbott, R.A., now acting schoolmaster at Shoeburyness; and it is due to him to state, that the reports which I have been enabled to make, together with the examination papers and drawings forwarded for the information of the Council of Military Education, have been thought deserving of the approval of the Council and of Field Marshal His Royal Highness the General Commanding-in-Chief.

Duty soldiers' evening schools, average attendance 340.

In the schools of the duty soldiers, although the attendance is carefully observed, it is almost impossible to measure progress. The average number present is about one-third of the school strength, and the instruction lasts for one hour on five days in the week. I am most desirous of doing full justice to the labours of the schoolmasters and their assistants in these schools. Their work is surrounded with many difficulties. It cannot be said that soldiers like to go to school after other duties are done; and this is especially true of those whom it is most difficult to teach, viz., the least educated among them. It is, in my judgment, desirable that the school attendance of duty soldiers or recruits should either be voluntary, or the instruction should last for two hours a day, which would be long enough to afford a fair expectation of some progress being made. In almost every inspection I have made of duty soldiers' schools, I have been strongly impressed with the poorness of the results obtained after considerable expense had been incurred on the part of the Government, and much labour endured by the schoolmaster. Some schoolmasters well know that noticeable progress is not to be expected generally in these schools. They also know that it is just as difficult for a man to learn to read now as it was many years ago; and that if progress is to be made, more time for regular instruction must be allowed.

I would, however, desire again to avow my belief that the schoolmasters and teachers do the best they can for their scholars in the time they attend, and that signs of care and attention are observable in some of the men's work, more especially in that of the non-commissioned officers, I here beg to state that I do not wish to suggest the voluntary attendance of non-commissioned officers under any circumstances. They must

App. II. No. 8.

be educated within the service up to a certain standard, and they will, therefore, always provide employment for the schoolmasters; for it is not yet the case that a sufficient number of men enter the service who possess education enough, with other necessary qualifications, to enable them to undertake the duties of non-commissioned officers.

Trumpeter's school.

The trumpeters attend the men's evening schools, excepting in the Depôt Brigade, Royal Artillery, at Woolwich, where a separate school for them, open 1½ hours a day, has long been established. About fifty trumpeters attend here, and they are taught the same subjects as the grown boys with considerable success. They also receive special religious instruction from the chaplains.

Grown children's schools.

There are two separate schools for grown girls at Woolwich, taught entirely by the schoolmistresses and pupil-teachers. Total strength 143 girls. In like manner there are also two separate grown boys' schools, taught by the schoolmasters of the Horse Brigade and Depôt Brigade, Royal Artillery, respectively. These separate schools were established about sixty years ago; 192 grown boys now attend them. There are also three "mixed" schools, containing 103 boys and girls, who are taught by the schoolmasters and their assistants, the girls removing to the industrial schools under the schoolmistresses in the afternoon. The total of grown children receiving instruction is 447.

Reading, writing, spelling, and arithmetic are soundly taught in every class. There is a marked and very general improvement in each of these subjects, but much care will be necessary before really good "reading" is heard in these schools. The children read mechanically, there is an absence of expression, and they often misplace the *h*. It is nevertheless, very much better taught than it was, great pains having been taken in some of the schools to improve the reading, even at the expense of other needful subjects of instruction.

In writing also much improvement has been made by both boys and girls. They are soon put to small hand after they leave the infants' schools, and useful small hand writing is general among them.

The plan of teaching small hand from the beginning is I think very effective. Children soon learn to write usefully if they are taught with care, otherwise the old plan had better be continued.

I have seen good small hand written in the infants' school, Horse Brigade, Royal Artillery, taught by Acting Schoolmistress Miss Henry.

There are few children in the largest schools here who cannot write from dictation or transcribe neatly and creditably. Their arithmetic is also good, and they possess a fair knowledge of geography, Scripture history, English history, and English grammar. In three of the senior classes of boys some progress has been made in Euclid, algebra, and mensuration. Singing is taught in all the schools. It is sometimes practised more than it ought to be.

Infants' schools.

The infants' schools are attended by 547 children. They are taught by the mistresses and teachers with care and kindness. This is especially true of the infants' school, Military Train, under Schoolmistress Mrs O'Neill, of which I was recently enabled to make a very satisfactory report to the Council.

Reading is generally well attended to in the infants' schools, but the children still stay too long in them. They are often admitted when they are little more than three years old, and they seldom go to the grown children's school before they are eight. I have no doubt that this may be corrected if due diligence is exercised by the schoolmistresses and teachers.

I have before brought this under notice, and the Council were pleased to issue certain orders thereon. I am still strongly of opinion that much more good may be done in infants' schools than has hitherto been

accomplished, and that, since collective teaching is less practised than formerly, the fruits of diligent instruction may be shown in the greater number of children annually transferred from the infants' to the grown children's schools.

The industrial schools are attended by 450 children. These children do not bring much of their own work to school, either to make or mend. I have often urged this fact on the attention of the schoolmistresses, with reference to the regulations relative to industrial schools; and I think it may be explained by a sufficiency of work for the year being provided out of the Government grant. Fancy work is not now taught in any of the schools.

I usually examine with care the industrial work of the schools I inspect, and I think there is no reason to doubt that this valuable instruction is properly carried on. I understand also that this is the opinion of the ladies who assist at the periodical distribution of the children's work.

School accommodation.

The school accommodation in this district is now, for all purposes, both ample and good.

Books.

I have long been of opinion that a change of school books is sometimes desirable for both teachers and scholars. Some of those now in use are known to them almost by heart, and they do not, therefore, offer much inducement to study on the part of the schoolmaster. I know that change of this kind cannot lightly be made, the cost thereof being too great for a mere experiment; but I am not the less of opinion that a periodical revision of the list of school books would be highly beneficial to both scholars and schoolmasters.

Lectures and entertainments to the troops.

During the past winter a continued series of lectures, concerts, and theatrical entertainments has been given here, and is being continued at this date. In the report on lectures, &c., recently furnished to the Council by the Commandant, for the season ending 30th April 1864, about 17,000 persons, chiefly soldiers, are shown to have attended these entertainments, &c. Since that date the number has been increased to more than 20,000.

Schoolmasters, schoolmistresses, and their assistants.

I have great satisfaction in reporting, for the information of the Council, that the conduct of the schoolmasters, schoolmistresses, and school teachers generally has been, to the best of my belief, unexceptionable. They have been attentive to and regular in the performance of their duties; and I cannot but acknowledge their readiness to co-operate with me in all that relates to effectually carrying on the school duties of this district.

I have, &c.
(Signed) C. Wharry,
Quartermaster, Royal Artillery.

The Brigade Major,
&c. &c.

Woolwich, 18th June 1864.

App. III. No. 1.

Appendix III.—No. 1.

Alphabetical List of Army Schoolmasters.

Class.	Names.	Class.	Names.
2	Alderton, F.	Army	Cooper, A.
2	Allen, B. C.	Army	Coughlan, J.
Army	Anderson, T.	Army	Croad, H. J.
Army	Annett, E. J.	2	Curtis, G. E.
Army	Annett, G. L.		
Army	Arthur, W. M.	Army	Davies, D. J.
Army	Assan.	3	Davison, T.
3	Astbury, J.	2	Devereux, C. A.
Army	Atkinson, C.	Army	De Winter, J.
		Army	Duffield, F.
Army	Bacon, E.	2	Dunn, F. W.
Army	Barnes, A.		
3	Barrett, T.	1	Earp, T.
Army	Bartram, W.	Army	Eldridge, J. B.
Army	Bass, J.	3	Etler, C.
Army	Bateman, R.		
3	Bell, Jno. L.	3	Fenton, G.
3	Bell, R.	3	Fleming, C. M.
3	Belling, Frederick.	Army	Fletcher, C.
Army	Belling, Regd.	Army	Flinter, T.
Army	Berresford, J.	Army	Flood, Henry.
3	Binckes, H. A.	Army	Foster, J. H.
3	Bingham, J.	2	Fowler, C. B.
1	Bird, W. H.	Army	Fryer, W.
Army	Black, M. A.		
Army	Boland, J.	2	Gell, W.
2	Bolus, F.	1	Giles, E.
Army	Boughton, G. H.	Army	Gillmore, J. W.
Army	Bramhall, E.	2	Goadby, S. H.
Army	Brammer, J.	3	Godwin, H.
3	Brown, R. L.	2	Grant, Jno.
Army	Brown, Wm. J.	Army	Grant, John.
3	Bryan, W.	Army	Green, George.
Army	Burgham, J. A.	2	Green, Richard.
Army	Burnett, W.	3	Greene, Percival.
Army	Burns, Jno.	Army	Gunn, J. R.
3	Butler, P.		
		Army	Hamilton, G. B.
Army	Calladine, T.	3	Haydod, C.
3	Cameron, A.	Army	Hayes, J. J.
Army	Capon, A. R.	Army	Hazard, J.
1	Carnegie, C.	Army	Hebb, H. H.
2	Carroll, J.	2	Henderson, J.
Army	Carson, T.	2	Hickling, J. S.
Army	Carthew, E.	Army	Higgins, D.
2	Cartwright, J.	3	Hildyard, G. E.
2	Chambers, J.	Army	Hobbs, J.
2	Clarke, C.	Army	Holland, G.
3	Clarke, J. A.	Army	Howard, Wm. R.
Army	Clarke, P. H. T.		
1	Clift, C. W.	Army	James, T. W.
Army	Colquhoun, W.	Army	Johnstone, E.
Army	Comerford, J.	Army	Jones, T. W.

Class.	Names.
Army	Kavanagh, J. J.
2	Keley, H.
Army	Kenny, R. T.
Army	Kidd, J.
3	Le Mar, W.
Army	Loftus, M.
2	Lowman, E.
Army	Lowry, F.
3	Macartney, E. K.
3	Macartney, George.
Army	Mahoney, J.
Army	Major, F. J.
Army	Mallandain, C.
Army	Masterson, J.
Army	Mathews, L.
2	McCarthy, R.
Army	McCaskery, G.
3	McCormick, R.
Army	McElwee, A.
2	McEwen, W.
Army	McGoverne, R. W.
2	McIlherron, D.
2	McKay, D.
Army	McKee, J.
1	McKinder, W. M.
Army	McLean, Jas. H.
Army	McLean, J. W.
2	McLean, R.
Army	McMahon, Arthur.
Army	McMahon, Thomas.
Army	Mills, P.
Army	Minnion, W.
Army	Moore, J.
2	Moran, J.
3	Morgan, W. G.
Army	Mottram, H.
Army	Murray, Jno. H.
3	Myles, W. E.
Army	Naylor, C.
Army	Northway, J.
Army	O'Brennan, W.
Army	O'Brien, Jno.
3	O'Brien, William.
3	O'Connor, Michael.
Army	O'Connor, Thomas.
Army	Ogg, G.
Army	O'Sullivan, C.
2	Parsons, A.
3	Parsons, H.
Army	Patton, H.
Army	Peel, T.
Army	Perkins, J. C.
3	Pither, Jas. R.
Army	Polden, T.
3	Porter, Jas. H.
Army	Potterton, J.
3	Pratt, G.
1	Pringle, R.
2	Purdon, S.
Army	Redman, W.
Army	Reeves, J. McC.
Army	Revell, N.
2	Rice, G. T.
2	Richardson, W.
2	Robertson, Alex.
3	Robertson, C. A.
1	Robertson, Geo.
Army	Robinson, Horatio.
2	Robinson, Wm.
1	Rogers, E. H.
2	Ruffle, T. R.
Army	Ruggles, G.
2	Runcieman, A.
Army	Rutherford, R.
1	Savage, W.
Army	Scarlett, T. H.
Army	Sessford, J. R.
Army	Shannon, W.
Army	Sheepwash, W. W.
Army	Sheffield, George.
Army	Sheffield, Thomas.
Army	Ship, S.
2	Shipman, E.
Army	Short, T.
Army	Smith, Geo.
Army	Smith, Thomas W.
2	Sotheran, J. A.
Army	Souter, W.
Army	Spalding, J.
Army	Spong, G.
1	Stanton, C.
2	Stapley, L. A.
2	Stapley, R. C.
1	Stewart, J.
Army	Stewart, J. W.
Army	Stewart, Peter.
3	Stubbs, W. H.
2	Tapsell, J.
3	Taylor, R.
1	Thacker, W.
3	Thomas, J. H.
2	Thompson, A. A.
Army	Thomson, Jas. F.
Army	Venn, G.
Army	Venner, H.
2	Walker, T.
Army	Ward, F. K.
Army	Waters, R.

App. III. No. 2.

Class.	Names.	Class.	Names.
2	Webb, C. D.	Army	Williams, James.
Army	Weller, W.	Army	Willsher, J.
Army	Wheeler, W.	3	Wilson, Chas. M.
Army	Whitaker, F.	Army	Wroughton, J.
Army	Wicks, T.		
Army	Williams, David.	2	Yorke, T. B.
Army	Williams, Emanuel.	Army	Young, G.

Appendix III.—No. 2.

COUNCIL OF MILITARY EDUCATION.

SCHOOLMASTER'S SPECIAL CERTIFICATE.

FIRST CLASS.

_____ having highly distinguished himself in the Training Schools of the Royal Military Asylum, Chelsea, and having been recommended by the Council of Military Education, is hereby awarded, under the authority of His Royal Highness the Field Marshal Commanding in Chief, this Special Certificate of the First Class.

Dated,
Office of the Council of Military Education,
this ____ day of _____ 18____.

COUNCIL OF MILITARY EDUCATION.

SCHOOLMASTER'S SPECIAL CERTIFICATE.

SECOND CLASS.

_____ having distinguished himself in the Training Schools of the Royal Military Asylum, Chelsea, and having been recommended by the Council of Military Education, is hereby awarded, under the authority of His Royal Highness the Field Marshal Commanding in Chief, this Special Certificate of the Second Class.

Dated,
Office of the Council of Military Education,
this ____ day of _____ 18____.

App. IV. No. 1.

COUNCIL OF MILITARY EDUCATION.

SCHOOLMASTER'S ORDINARY CERTIFICATE.

_____ having passed satisfactorily through the Training Schools of the Royal Military Asylum, Chelsea, and having been recommended by the Council of Military Education, is hereby awarded, under the authority of His Royal Highness the Field Marshal Commanding in Chief, this Ordinary Certificate of Qualification.

Dated,
Office of the Council of Military Education,
this ____ day of _____ 18 ___.

Appendix IV.—No. 1.

List of Schools in I. Division, furnished by Major Gleig.

Description of School.	Number or Designation of Corps.	Present Station of Corps.	Adults.	Grown Children.	Infants and Industrial.
Garrison.	Garrison Staff	Aldershott, P. Barracks	–	–	1
	Do. do.	Aldershott, North Camp	–	–	1
	Do. do.	Shorncliffe	–	1	1
	Brigade of Guards	Victoria L. House	–	1*	1
	Royal Artillery	Woolwich, Cambridge Cottages	–	–	1
	Royal Artillery and Military Train	Woolwich Common	–	1	1
		Woolwich General Hospital	–	–	1
	Total of Garrison Schools		–	3	7
Depôt Battalion.	Depôt Brigade, R.H.A.	Canterbury	1	1†	1
	Do. do.	Woolwich	1	2‡	1
	Cavalry Depôt	Canterbury	1	1§	1§
	Do. do.	Maidstone	1	1	1
	Depôt Brigade, R.A.	Sheerness	1	1	1
	Do. do.	Warley	1	1	1
	Do. do.	Woolwich	1	2‖	1
	Guards Depôt	London	1	–	–
	1st Depot Battalion	Chatham	1	1	1

* Girls only.
† Taught with those of cavalry.
‡ Separate schools of grown boys and grown girls.
§ Taught with those of R.H.A.
‖ Separate schools of grown boys and grown girls.

App. IV, No. 1.

Description of School.	Number or Description of Corps.	Present Station of Corps.	Adults.	Grown Children.	Infants and Industrial.
Depôt Battalion.	2nd Depôt Battalion	Chatham	1	1	1
	3rd do. do.	Do.	1	1	1
	4th do. do.	Colchester	1	1*	1*
	6th do. do.	Walmer	1	1	1
	9th do. do.	Colchester	1	1*	1*
	10th do. do.	Do.	1	1*	1*
	Total of Depôt Battalion Schools		15	16	14
Regimental.	1st Life Guards	London	1	1	1
	2nd Life Guards	Windsor	1	1	1
	R.H. Guards	London	1	1	1
	VI. Dragoon Guards	Aldershott	1	1	1
	I. Royal Dragoons	Do.	1	1	1
	VIII. Hussars	Brighton	1	1	1
	XII. Lancers	Hounslow	1	1	1
	XIII. Hussars	Aldershott	1	1	1
	XVIII. Hussars	†Norwich	1	1	1
	Military Train	Aldershott	1	1	1
	Do. do.	Woolwich	1	–	–
	2nd Brigade, R.A.	Dover	1	1	1
	4th do.	Aldershott	1	1	1
	9th do.	Shorncliffe	1	1	1
	13th do.	Woolwich	1	1	1
	Royal Engineers	Brompton	1	2‡	1
	Do. do.	Aldershott	1	1	1
	Commissariat Staff Corps	Do.	1	–	–
	2nd Battalion Grenadier Guards	London	1	1§	1§
	3rd do. do. do.	Do.	1	1	1
	1st Battalion Coldstream do.	Do.	1	1	1
	2nd do. do. do.	Do.	1	1	1
	1st do. Scots Fusilier do.	Windsor	1	1	1
	1/3rd Foot	Aldershott	1	1	1
	1/5th do.	Shorncliffe	1	1	1
	1/6th do.	Aldershott	1	1	1
	1/24th do.	Shorncliffe	1	1	1
	37th do.	Aldershott	1	1	1
	59th do.	Do.	1	1	1
	1/60th do.	London	1	1	1
	2/60th do.	Aldershott	1	1	1
	73rd do.	Do.	1	1	1
	75th do.	Do.	1	1	1
	78th do.	Dover	1	1	1
	83rd do.	Aldershott	1	1	1
	85th do.	Dover	1	1	1
	87th do.	Aldershott	1	1	1
	Total of Regimental Schools		37	36	35

* The children of the 4th, 9th, and 10th Depôt Battalions are instructed together; but this arrangement will, I hope, soon cease, at least as regards the elder children.

† It is reported that this station is about to be abandoned, and the cavalry transferred to Colchester.

‡ Separate schools of grown boys and grown girls.

§ In St George's barracks; miserably small.

Description of School.	Number or Designation of Corps.	Present Station of Corps.	Adults.	Grown Children.	Infants and Industrial.
Detachment.	XVIII. Hussars	Ipswich	1	1	–
	R.H. Artillery	Aldershott	1	–	–
	R. Artillery	Shoeburyness	1*	1	1
	Foot Guards (2nd Battalion Grenadiers)	Chelsea	1	–	–
	R. Artillery	Woolwich	1†	–	–
	Infantry (1/60th Rifles)	Kensington	1	1	–
	Total of Detachment Schools		6	3	1
	SUMMARY OF THE FOREGOING RETURN.				
	Garrison Schools		–	3	7
	Depôt Battalion Schools		15	16	14
	Regimental Schools		37	36	35
	Detachment do.		6	3	1
	GRAND TOTAL		58	58	57

* There was an adult school at Shoeburyness during the winter, and I believe that it may be expected to re-assemble next winter. At present it is in abeyance. But I have included it in this return as one requiring annual inspection; and it will be necessary, in order to ensure this, that the Inspector's visit to Shoeburyness be made earlier in the year for the future than has heretofore been customary.

† Special class of non-commissioned officers.

NOTE 1.—The division at Aldershott is weaker by one regiment of cavalry and by more than one regiment of infantry than it has usually been at this season. If additional troops join it for the summer (as I suppose to be probable), the number of children's schools will be increased. The number of adult schools may be somewhat increased also, but to a less extent than the number of children's schools, because a certain proportion of the troops is generally under canvas in summer, and this, whilst it lasts, puts a stop to the work of a corresponding proportion of the adult schools.

NOTE 2.—There was formerly a detachment school at Landguard Fort, which I inspected. It died out about two years ago, I think; possibly earlier; but at my last visit to Colchester, I learnt that it had been revived, and I arranged that forms of report should be applied for, and the usual monthly report of the school be made. It is possible, therefore, that there may be an adult and children's school to be added to the list of detachment schools on this account.

NOTE 3.—I have not included the school at Milton barracks, Gravesend, nor any of the schools established in martello towers, because I have never inspected them; and it does not appear from the monthly report that the results of an inspection would be worth the time or the trouble or the expense.

A. C. GLEIG, Assistant Inspector, Army Schools.

May 12, 1864.

App. IV. No. 2.

Appendix IV.—No. 2.

List of Schools in II. Division, furnished by J. P. Sargeaunt, Esq.

Stations.	Regiments, &c.	Adults.	Grown Children.	Infants and Industrial.
Fort George	Garrison	–	1	1
Devonport	„	–	1	1
Aberdeen	23rd Depôt Battalion	1	1	1
Stirling	22nd „ „	1	1	1
Preston	11th „ „	1	1	1
Pembroke Dock	8th „ „	1	1	1
Parkhurst, Isle of Wight	5th „ „	1	1	1
Winchester	7th „ „	1	1	1
Glasgow	41st Regiment	1	1	1
Edinburgh	92nd „	1	1	1
Piershill	15th Hussars	1	1	1
Leith Fort	Royal Artillery	1	1	1
Salford	49th Regiment	1	1	1
Manchester	3rd Hussars	1	1	1
Sheffield	1/8th Regiment	1	1	1
York	16th Lancers	1	1	1
Birmingham	2nd Dragoons	1	1	1
Devonport	31st Regiment	1	1	1
„	1/2nd „	1	1	1
Plymouth	5th Brigade Royal Artillery	1	1	1
Portsmouth	26th Regiment	1	1	1
„	53rd „	1	1	1
„	6th Brigade Royal Artillery	1	1	1
Gosport	64th Regiment	1	1	1
„	7th Brigade Royal Artillery	1	1	1
Netley	Royal Victoria Hospital	1	1	1
Perth	Detachment 23rd D. B.	1	1	1
Hamilton	„ 13th Hussars	1	1	1
Paisley	„ 41st Regiment	1	1	–
Ayr	„ „	1	1	1
Greenlaw	„ 92nd „	1	1	–
Tynemouth	„ Ct. Brigade	–	1	–
Ashton	„ 3rd Hussars	*	*	*
Bury	„ „	*	*	*
Fleetwood	School of Musketry	–	1	1
Weedon	Detachment 1/8th	1	1	1
„	„ 2nd Dragoons	1	–	1
Coventry	„ „	1	–	1
Drake's Island	„ 5th B. R. Artillery	1	1	1
Fort Grange	„ 7th „	–	1	1
Fort Victoria, Isle of Wight	„ „ „	1	1	1
Fort Monckton	„ „ „	1	1	1
S. S. Castle	„ 6th „	1	1	1
Sandown, Isle of Wight	„ 7th „	1	1	1
Tipnor	„ 64th Regiment	1	1	1
Marchwood	„ „ „	1	1	1
Portland	„ „ „	1	1	1
Hilsea	„ Royal Artillery	1	1	1

* The 3rd Hussars has detachments at these places, but I have no returns yet whether or not schools have been established.

Appendix IV.—No. 3.

App. IV. No. 3.

List of Schools in III. Division, furnished by E. A. Vicars, Esq.

Station.	Corps.	Schools.		
		Adults.	Grown children.	Infant and Industrial.
Dublin	4th Dragoon Guards	1	1	1
Cabir	5th „ „	1	1	1
Dundalk	4th Hussars	1	1	1
Newbridge	9th Lancers	1	1	1
Dublin	10th Hussars	1	1	1
„	11th „	1	1	1
Newbridge	15th „	1	1	1
Ballincollig	Royal Artillery	1	1	1
Limerick	„ „	1	1	—
Clonmel	„ „	1	—	—
Newbridge	„ „	1	—	—
Athlone	„ „	1	—	—
Dublin, Royal Barracks	„ „	1	—	—
Dublin, Portobello	„ „	1	—	—
Curragh	6th Battalion, Military Train	1	1	1
„	1st Battalion 10th Foot.	1	1	1
Waterford	Detachment „	1	1	—
Dublin	1st Battalion 11th Foot	1	1	1
„	2nd Battalion 12th Foot	1	1	1
Curragh	29th Regiment	1	1	1
„	32nd „	1	1	1
„	41st „	1	1	1
Dublin	45th „	1	1	1
Curragh	58th „	1	1	1
Enniskillen	Detachment „	1	1	—
Dublin	84th „	1	1	1
Curragh	86th „	1	1	1
Athlone	12th Depôt Battalion	1	1	1
Birr	13th „ „	1	1	1
Belfast	14th „ „	1	1	1
Buttevant	15th „ „	1	1	1
Templemore	16th „ „	1	1	1
Limerick	17th „ „	1	1	1
Fermoy	18th „ „	1	1	1
„	19th „ „	1	1	1
Cork	20th „ „	1	1	1
	Garrison.			
Dublin	Royal Barracks	—	1	1
„	Portobello	—	1	1
Newbridge	-	—	1	1
Richmond	-	—	—	1
Curragh	-	—	—	1

App. V. No. 1.

Appendix V.—No. 1.

Instructions for Assistant Inspectors of Army Schools, forwarded under Letter of the 5th November 1862.

I. The Inspectors are to visit each School in their districts at least once a year; and in fixing the time of each visit they are to adhere, as far as may be possible, to the Scheme of Inspection previously prepared by them, and approved by the Council of Military Education.

W.O. Forms 630. 631 (A.) 632 (B.) 633 (C.) 642 (D.) 643 (E.) 644 (F.)

II. In their inspection of the schools and in their reports thereon to the Council, and in the abstract they are to make of them for the information of the commanding officer, they are to use the printed Forms which will be supplied to them.

III. They are to address to the commanding officer an official letter (W.O. Form 630) announcing the day of the inspection, at least one week before; and they are to enclose with it the Forms A., D., and E.

IV. Should the commanding officer not be able himself to accompany them to the school, they are to request him to appoint some other officer for that duty.

V. They are to take with them to the school as many of the Forms B. and C. as they think likely to be required, and also one of those Forms filled up as a "Key," with questions, &c. resembling, and as nearly as possible of the same difficulty as those on a model Form which will be supplied for their guidance.

VI. When inspecting an adult school they are first to examine in reading and spelling those soldiers who are unable to write on paper,* and to give to each of the rest a copy of Form B., and to dictate, or instruct the schoolmaster to dictate, from the "Key" the passage to be written.

VII. The sums are then in like manner to be dictated from the "Key," the soldiers filling up from such dictation the blanks in their respective Forms. To ensure accuracy, these sums are, moreover, to be written by the schoolmaster on the blackboard.

VIII. Form C. is to be supplied, together with Form B., to such of the soldiers as are reported by the schoolmaster as competent to answer the questions on that Form; and the blanks on it are to be filled up in the same way.

IX. One hour and a half is to be allowed for dictation and answering the sums on Form B., and two hours for answering those on Form C., together with the questions in history and geography.

The sums on Form B. are not required to be worked in addition to those on Form C.

The inspector and the schoolmaster are to be present throughout the examination. Any soldier detected in copying is to be reported to the commanding officer. The papers are to be taken charge of after the examination by the inspector.

X. One half day at least is to be devoted to the examination of the adult school, and another half day at least to those of the children, and the inspectors are invariably to be present at the hour at which the

* Those are to be considered unable to write on paper who cannot write legibly the answers to the questions at the head of Form B.

school is opened, in order that they may report specially on the Bible lesson given by the schoolmaster and schoolmistress during the first half hour.

XI. They will request the commanding officer to allow a holiday at the school on the day after the examination, and to permit the schoolmaster and the assistants to attend upon them on that day at the school-room for the purpose of examining the papers. They are to mark the words wrongly spelled from dictation, and the sums wrongly worked, and to fill up the table at the foot of the first page of each man's copy of Form B.

XII. From the forms so marked by the schoolmaster and his assistants the inspectors are to fill up the table at the foot of the first page of their report (Form D.) to the Council. They are then to complete that report, which is to embrace the following points, viz. :—

1. As to the intelligence of the soldiers and children in the subject matter of the books they read.
2. As to their knowledge of history and geography.
3. As to their instruction in other subjects.
4. As to the Bible lesson given by the schoolmaster and schoolmistress, and the days and hours on which the chaplains attend.
5. As to the lectures delivered (*vide* par. 15).
6. As to whether the schoolmaster's report, Form A., on the state of the schools, is confirmed generally by the result of their examination and inspection.
7. As to the manners, behaviour, and tidiness of the children.
8. As to the number of men who have been taught to read and write since entering the school.
9. As to the efficiency of the schoolmaster and his assistants.
10. As to that of the schoolmistress and her assistants.
11. As to the school books, whether they are those allowed by the regulations, whether they are kept in good order, whether the supply is sufficient or otherwise, or in excess of the requirements of the school.
12. As to the size of the school-rooms, whether they are well warmed, ventilated, and lighted, and whether they are well supplied with the necessary school apparatus, &c.
13. As to any other matters which the inspectors may consider it necessary to report upon.

XIII. The inspectors are to visit the garrison libraries and regimental recreation rooms of each station, and report upon the several points specified in Form F., and make such further observations as may appear to them to be necessary.

XIV. Having completed their inspection, they will, before leaving the station, forward to the Council the following documents, viz. :—

Report (Form D.)
Schoolmaster's Return (A.)
Three specimens of work done on Forms B. and C., viz., the best, an average specimen, and the worst.
Report (Form F.)

App. V. No. 1.

They will also leave for the commanding officer's information an abstract upon Form E. of their report to the Council, which abstract is to embrace all the subjects enumerated in paragraph 12 of these instructions, with exception of Nos. 6, 9, 10, 13, together with such observation on the library and recreation room as may appear to them to be necessary.

XV. They are to report to the Council whether lectures are delivered to the soldiers, and other intellectual amusements are fostered in connexion with the schools. They are to specify the number of such lectures delivered in the year, and the subjects of them, together with the names of the lecturers; and are further to state the average attendance on such lectures, and which of them have been the best attended.

XVI. It is their duty to inquire into and to keep the Council of Military Education informed of all that concerns the education of the soldier and his children, in the districts assigned to their inspection; of the discipline of the army schools; of the moral character of the teachers; of their manner, temper, and general treatment of their scholars, and their deportment to their superiors; but they are to give no orders.

XVII. On or before the 31st December of every year, the inspectors will lay before the Council of Military Education a general report on the schools of their respective districts, founded on the reports they have made on them at the times of their inspections.

XVIII. The inspectors will forward their travelling claims to the Council at the termination of each quarter.

All communications which the inspectors may wish to make to His Royal Highness the General Commanding-in-Chief, or the Secretary of State for War, are to be sent through the Council.

W. O. Form 630.

_____ 18____

Sir,

I have the honour to inform you that, in conformity with the Army School Regulations, I propose, if convenient to you, to inspect the Schools of the_____under your command on _____the _____of_____ at_____ and at the same time to visit and inspect the Libraries, Soldiers' Reading Rooms, and Lecture Rooms.

I am instructed to lay before the Council of Military Education a Report on the state of the Schools, an abstract of which will be communicated to you.

I am, moreover, to confer with you on matters connected with the interests of the Schools, &c., and to co-operate with you therein to the utmost extent of my power.

You will oblige me by informing the Schoolmaster of the day of my inspection, and by directing him to fill up the blanks left for him in the inclosed Forms A, D, and E, before I come to the School. The first part alone of Forms D and E is to be filled up by the Schoolmaster before the examination. It is desirable that every person attending the School, who can write his name, should be provided on the day of inspection with a pen and ink, piece of blotting paper, and a slate.

I have the honour to be,
Sir,
Your obedient servant,

Assistant Inspector of Army Schools.

The Officer Commanding

APP. V.
Form A.

A.

Schools of the _____

(*stationed at*) _____

SCHOOLMASTER'S

TABLE to be filled up by the Schoolmaster before the Inspection.

Number of Children on the Books, including Infants.	Boys.	Girls.	Total.
Under Four years of Age			
Between Four and Five			
Between Five and Six			
Between Six and Seven			
Between Seven and Eight			
Between Eight and Nine			
Between Nine and Ten			
Between Ten and Eleven			
Between Eleven and Twelve			
Between Twelve and Thirteen			
Between Thirteen and Fourteen			
Over Fourteen			
Total			
Estimated Number in Garrison or Battalion			
Number who have been in the Scoool. — Less than One Year			
— One Year†			
— Two Years†			
— Three Years†			
— Four Years†			
— Five Years and over			
Admitted in last Twelve Months			
Left in last Twelve Months			
Highest Weekly Average in past Year			
Lowest Weekly Average in past Year			
Average Attendance for past Year. — Grown Children and Infants			
— Industrial			
Present ordinary Attendance			

Dimensions of—	Length.	Breadth.	Height.
School-room, Adults and Grown Children			
Infants and Industrial			

Has the Schoolmaster or the Schoolmistress been absent from duty during the past half-year? If so, for what cause, and during what period?

What Vacations have been granted?

* Each Scholar is to be counted as being in the highest Reading Lesson Book, and in that only, master thinks he can work correctly. Thus, if the highest rule he can work be Division, he must be these last rules also.

† Understand "*but less than*" the next heading.

REMARKS BY SCHOOLMASTER.

W. O. Form 631. APP. V. Form A.

A.

RETURN.

Date of Inspection _____ 18 .

TABLE to be filled up by the Schoolmaster before the Inspection.

Up to what point may be examined.			Adults.				Grown Children.		Infants.
			Sergeants.	Corporals.	Lance do.	Privates.	Boys.	Girls.	
Reading		Letters and Monosyllables*							
		Easy Narratives*							
		Books of General Information easily							
Writing	From Copy.	On Slates							
		On Paper							
	From Dictation.	On Slates							
		On Paper							
Arithmetic.	Simple Rules.	Addition*							
		Subtraction*							
		Multiplication*							
		Division*							
	Compound Rules.	Addition*							
		Subtraction*							
		Multiplication*							
		Division*							
		Proportion*							
		Practice*							
		Fractions*							
		Decimals*							
		Higher Rules*							
Geography									
Grammar									
History									
Music from Notes									
Drawing									
Other Subjects (if any).									

Days and Hours of Attendance of Grown Children's School.

Industrial.	Hemming	
	Sewing	
	Darning	
	Cutting out and Making	Under Clothes
		Dresses

Days and Hours of Attendance of
Infant School _____
Industrial School _____

Signature of Schoolmistress. _____ Class.

Number of Adults at present in the School who have learned to read since entering.
Serjeants _____
Corporals _____
Lance do _____
Privates _____

which the Schoolmaster thinks he can read; and in the highest rule of Arithmetic which the School-counted in that rule only, and not in Multiplication, Subtraction, or Addition, although he can work

Schoolmaster's Signature _____

_____ *Class.*

App. V.
Form B.

W. O. Form 632.

B.

EXAMINATION PAPER.

1. Write on this line your name. 2. The name of the place where you were born. 3. The county in which you were born. 4. The time you have been in the army. 5. The name of your regiment. 6. Your rank in the army. 7. The date of this day. 8. The name of this school.	

Write down some words which will be read to you (50 words).

SCHOOLMASTER'S REPORT, certified by the INSPECTOR.

Number of Mistakes in Spelling.	Sums worked correctly specified by their Numbers.		Can read at the most		
	Form B.	Form C.	Letters and Monosyllables.	Easy Narratives.	Books of general Information.

N.B.—A mark is to be put in that column whose heading represents the soldier's proficiency in reading.

Work as many as you can of the following sums on your slate, and then copy them carefully (with all the figures) on this paper, each one in its proper place.

Simple Rules.	*Compound Rules.*
1st. Add together	5th. Add together
2nd. Subtract from	6th. Subtract from
3rd. Multiply by	7th. Multiply by
4th. Divide by	8th. Divide by

W. O. Form 633. App. V. Form C.

C.

Write here your name_____

Write the name of your regiment_____

1. If things cost what will cost ?	5. the fractions
2. If £ will buy of how much will £ buy ?	6. Reduce to their simplest terms the fractions
3. Find, by the rule of practice, the cost of things at £ each.	7. What decimal is of ?
4. To what sum will £ amount in years at per cent. per annum interest ?	8. the decimal

History of England and Geography.

1. What kings reigned in the th century ?

2. Name the chief events in the reign of

3. Give some account of

4. Name the chief countries in the continent of

5. Name the chief mountain ranges, rivers, cities, and sea-ports in

6. What are the chief exports and imports of

APP. V. Form D.

W. C. Form 642.

D.

REPORT on the SCHOOLS of the _____
after Inspection by _____ on the _____ 186 ;
for the information of the Council of Military Education.

Commanding Officer _____

Schoolmaster _____ Class ____ Schoolmistress _____ Class ____

Assistants { _____ _____ _____ } Assistants { _____ _____ _____ }

RANK.	Effective Strength.	On School Books.	Average Attendance.	Present at Examination.	
Serjeants - - -					
Corporals - - -					
Lance corporals - -					
Privates - - -					
Drummers and band boys -					

QUESTIONS.	REPLIES.
How often in the week, and on what days, is the school open for adults?	
At what hours, and for how long at a time, are the non-commissioned officers separated from the men?	
Is any other school taught at the same time in the same school-room with the adults?	
Has any special class of adults been formed?	
State the numbers and rank of the persons attending the special class, and how many hours per week each person attends.	
During what hours and on what days are the schools open for the instruction of the children?	

N.B.—The above return is to be compiled by the schoolmaster before the inspection.

Signature of Schoolmaster _____

NUMBER present at the EXAMINATION.

RANK.	Number who can read, at the most			Number who wrote the Words on the accompanying Examination Paper with Errors, as follows:—				Number who worked correctly the Sums numbered								
	Letters and Mono-syllables.*	Easy Narra-tives.*	Books of General Information easily.*	0.	0-5.	5-10.	10-15.	1.	2.	3.	4.	5.	6.	7.	8.	—
Serjeants																Form B.
																Form C.
Corporals																Form B.
																Form C.
Lance do.																Form B.
																Form C.
Privates																Form B.
																Form C.

* Specify the book and the part of it in which the examination is made.

Signature of Inspector _____

REMARKS on ADULT SCHOOLS.

E. W.O. Form 643. App. V. Form E.

ABSTRACT OF REPORT on the SCHOOLS of the _____
after Inspection by _____ on the _____ 186 ;
for the information of the _____ Commanding.
_____ Regiment.

Schoolmaster _____ Class ____. Schoolmistress _____ Class ____.

Assistants { _____ _____ _____ } Assistants { _____ _____ _____ }

RANK.	Effective Strength.	On School Books.	Average Attendance.	Present at Examination.
Serjeants - - -				
Corporals - - -				
Lance corporals - -				
Privates - - -				
Drummers and band boys -				

QUESTIONS.	REPLIES.
How often in the week, and on what days, is the school open for adults?	
At what hours, and for how long at a time, are the non-commissioned officers separated from the men?	
Is any other school taught at the same time in the same school-room with the adults?	
Has any special class of adults been formed?	
State the numbers and rank of the persons attending the special class, and how many hours per week each person attends?	
During what hours and on what days are the schools open for the instruction of the children?	

N.B.—The above return is to be compiled by the schoolmaster before the inspection.

Signature of Schoolmaster _____

NUMBER present at the EXAMINATION.

RANK.	Number who can read, at the most			Number who wrote the Words on the accompanying Examination Paper with Errors, as follows:—				Number who worked correctly the Sums numbered								
	Letters and Mono-syllables.*	Easy Narratives.*	Books of General Information easily.*	0.	0–5.	5–10.	10–15.	1.	2.	3.	4.	5.	6.	7.	8.	—
Serjeants																Form B.
																Form C.
Corporals																Form B.
																Form C.
Lance do.																Form B.
																Form C.
Privates																Form B.
																Form C.

* Specify the book and the part of it in which the examination is made.

Signature of Inspector _____

REMARKS on ADULT SCHOOLS.

App. V.
Form F.

W. O. Form 644.

F.

REPORT on the LIBRARY and READING ROOM at _____

Number of subscribers - - - -

Average attendance - - - -

Number of volumes - - - -

Whether there is a reading room separate from the library, and whether the accommodation is sufficient - - - -

During what hours are they open? - -

Whether the reading room is well warmed, lighted, and ventilated, and comfortably furnished - - - - - -

What refreshments are provided - -

Whether there is separate room for games -

What games are the most popular? - -

Is the librarian fitted for his office? - -

Whether the commanding officer has any suggestions to offer - - - -

General remarks - - - - -

Appendix VI.—No. 1.

The following is the substance of a system of inspection which, on the recommendation of the Council, has been approved of by His Royal Highness the Field Marshal Commanding-in-Chief and by the Secretary of State for War, and which will shortly be substituted for the system explained in Appendix V.

1. Upon the name of an adult or grown child being entered on the school books, an examination book should be set apart for him.

2. The highest degree of education which the pupil has attained on joining the school will be shown by his written exercises in the first page of this book. The exercises will comprehend writing, in the various text hands, dictation, sums in arithmetic, geography, and history. The examination book will be submitted to the assistant inspector at the following examination, or to the superintending schoolmaster at his annual examination, and the exercises then done by the pupil will be compared with his previous exercises, so as to enable an estimate to be formed of the amount of progress that has been achieved in the interval. If the pupil is not sufficiently advanced to do such exercises, the schoolmaster will record on the first page the state of his knowledge on joining the school.

Similarly at each subsequent inspection and at every examination, by whomsoever it is held, the work done by the same pupil will be written in this book, and his degree of progress between such inspections or examinations will be thus ascertained and recorded.

The examination books will be kept by the schoolmaster, and only issued at inspections or examinations.

3. At stations to which superintending schoolmasters have been appointed, the duty of investigating the degrees of attainment and the rate of progress of the pupils will devolve upon them; and they will examine, for this purpose, every school over which they have superintendence once a year, if it has not been examined by an inspector or any other superintending schoolmaster during the last twelve months.

The assistant or local inspectors will at such stations give their attention to the ordinary working of the school, without actual examination, unless they consider it desirable for any reason to hold it. They will, however, examine all candidates for certificates of education, as hereafter explained.

4. The assistant inspector or the superintending schoolmaster will give a month's notice previous to the examination of a school, and every adult and child on the school books will be examined by the schoolmaster during that month. The work done by the pupils is to be entered in the examination book above described; and the abstract of the results of the examination will be shown by the schoolmaster in the Tables contained in Form D.

The assistant inspector or superintending schoolmaster will examine the different classes in each subject, and record the results in Table I. of Forms A. and B., so far as respects the attainments of the pupils of the adult and grown children's schools respectively who are present at the examination.

He will see whether the schoolmaster's previous statement on Form D is confirmed, in respect to those who are present, by the result of the examination; and whether it may in his opinion be accepted as a fair representation of the state of education in the school.

The assistant inspector or superintending schoolmaster will then inspect the examination books of the whole school, both of pupils present and pupils absent, and having compared the work done at the schoolmaster's preliminary examination, and at his own, with that done at

App. VI. No. 1.

previous inspections or examinations, he will note in how many cases progress has been achieved or otherwise, and enter the results in Table III. of Forms A. and B.

The Council will thus have before it the attainments of all the adults and children duly classified, as well as a statement showing the numbers that have made progress or otherwise.

The assistant inspector or superintending schoolmaster will also inspect the infant school and report upon its condition in Form C.

5. In general it is only possible to hold the inspections annually. More frequent means are necessary of testing the progress both of adults and children. Examinations will therefore be held by the schoolmaster half yearly, on convenient days, during the month immediately preceding the summer and winter vacations respectively; every adult and child on the books will be examined during those months; the work of the pupils is to be done in the examination books; and the results are to be entered in Form D., and a copy thereof forwarded to the Secretary to the Council, and a copy also to the assistant inspector.

As, however, it is undesirable needlessly to multiply examinations, it is to be understood that should the visit of the assistant inspector, or the examination by the superintending schoolmaster, take place in less than two months after the half-yearly examination, the schoolmaster's examination preliminary to inspection may be dispensed with; and that if the inspector or superintending schoolmaster's examination take place less than two months before the half-yearly examination, the latter may be dispensed with.

The above is explained in a foot note on Form D.

6. The assistant inspector will report the result of his inspection to the commanding officer on Form E. He will report to the Council on the libraries and recreation rooms on Form F.

7. As the Forms now proposed will give very accurate information at least twice a year of the attainments and progress of the adults and children attending school, the information at present given in the 2nd and 3rd pages of the Monthly School Report may be dispensed with. An amended Form of Monthly School Report is annexed.

W. O. Form 267.

8. The Council trust that the system of examinations now proposed, together with that of certificates of education which will be herein-after referred to, will give a stimulus to the work in the adult schools, which is much needed. But to enable this result to be more fully realized, it is desirable to amend the arrangements which at present obtain in the generality of army schools, namely, the distribution of the classes according to one subject alone, either reading or arithmetic. As a necessary consequence, the pupils in the same class are in very various stages in different subjects, and the advantage of collective instuction is to a great degree lost. Schoolmasters will therefore be directed to form their adult classes according to their attainments both in arithmetic and in reading; and so to arrange that on three days of the week adults shall attend the classes in reading, comprising also under this head writing, and history, and geography, and on two days of the week the classes in arithmetic.

Should it however be thought desirable, writing may be taught at the same attendance with arithmetic, by providing single sheets of paper, properly ruled for text-hand writing, instead of copy books, which require to be kept for the men in separate classes.

Should the instruction in either of the general branches, "reading" or "arithmetic," be unequally affected by field days or other causes preventing the attendance of the men, the balance should be restored as far as possible at the end of every month.

The same system is to be pursued in the grown children's schools as regards classification; but it will not be necessary in this case to give the instruction in arithmetic and reading on separate days of the week.

9. A further measure, by which it is believed the adult will be encouraged to make the best use of the means of education afforded to him, is the introduction, under the sanction of His Royal Highness, of certificates of education, to be issued by the commanding officer on the recommendation in writing of the assistant inspector. These certificates are to take the place of those which formerly received the approval of His Royal Highness, and which were signed by the schoolmaster, but are now seldom used.

The Council cannot but think that such a system will prove an incentive to many soldiers to improve themselves, and will tend to relieve the adult schools of much of the stagnation which has hitherto prevailed.

It will also afford ultimately a means of marking in a very definite manner the educational attainments of the men of different regiments, by the number of first, second, and third class certificates in their possession being published by the Council in their report.

It is only required to add that the candidates for such certificates should not necessarily be men attending school. The certificates are intended to mark the attainments of all the non-commissioned officers or soldiers who are willing to undergo the examination necessary for obtaining them.

Forms of the proposed certificates are herewith enclosed. A return showing the numbers in possession and recommended to be issued will be found in the third page of Form A.

A statement of the number of certificates in possession should be entered in the half-yearly reports of education forwarded to the adjutant-general.

Examination Book.

Directions for the use of this Book.

1. An examination book will be given to every adult and grown child on the school books.

This book is to be used by every pupil who is able to use it in his examination on joining the school, and at the examinations of the assistant inspector, of the superintending schoolmaster, or of the schoolmaster. It is to be kept by the schoolmaster, and only issued to the pupil at such examinations.

Previous to each examination the schoolmaster will write at the top of the page on which the pupil's work is to be done the number of his attendances at school since the last examination. If the pupil is not sufficiently advanced on joining the school, or at subsequent examinations, to use the book, the schoolmaster will write in it a statement to that effect on each occasion, specifying the date, and affixing his signature. In case of the transfer of an adult, his examination book may be given to him, if he desires it, otherwise it may be used for any school purposes.

2. The following work is to be done, in this book, at each examination :—

a. Exercises in writing, in large, round, or small hand; not less than two lines

b. An exercise in dictation ; about 50 words.

c. Exercises in arithmetic, in the standard to which the pupil has attained, two or three examples in each rule belonging to that standard, and, if thought fit, some examples in the rules belonging to the previous standards.

d. Answers to questions in geography and history.

3. At the commencement of every examination the pupil will write on the page on which he is about to enter his work, his rank and name, the name of the station, and the date.

4. The examiner will write one of the letters A. B. C. D. or E. on each exercise in dictation, or set of exercises in arithmetic, that fairly comes under the standard of attainment denoted thereby. He will also state the pupil's standard of reading.

App. VI. Form A.

A.

_____ Regiment of _____, commanded by _____

Report of the Adult School after Inspection by _____, on the _____ 186 ;
for the Information of the Council of Military Education.

Station _____. Schoolmaster _____. Class _____.

Assistants _____

I.—Table showing Degrees of Attainment.

Class.*	Numbers present.	Number who have attained the Standard of Reading denoted by †				Number who have attained the Standard of Dictation denoted by †				Number who have attained the Standard of Arithmetic denoted by †					Number whose Knowledge is above or below the Standards.		
		A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.	E.		Above A.	Below D. or E.
Special - -															Reading - -		
1st - - -																	
2nd - - -															Dictation - -		
3rd - - -																	
4th - - -															Arithmetic -		
5th - - -																	
6th - - -																	
Total - -																	
Total per cent. of those examined -																	

* The classes referred to in this Table and in that of the Degrees of Progress are to consist of the pupils who are ordinarily taught the same subjects together, the 1st being the highest of the numbered classes.

† Reading and Dictation.—Standard A.: Supplement to the Fourth Book of Lessons; Standard B.: Fourth Book of Lessons; Standard C.: Sequel to the Second Book of Lessons; Standard D.: Second School Book.

Arithmetic.—Standard A.: Vulgar Fractions, Decimals, Compound Proportion; Standard B.: Practice, Simple Proportion, Interest (with application to Regimental Savings Bank Accounts); Standard C.: The four Compound Rules‡ and Reduction of Weights and Measures, with application to Mess Book and Ledger Accounts; Standard D.: The four Compound Rules and Reduction of Money, with application to Mess Book and Ledger Accounts; Standard E.: Simple Multiplication and Division (Long).

A pupil is to be classed under any Standard when he does fairly any portion of the work denoted by that Standard. Pupils whose work is indifferent or bad will be reckoned under one of the lower Standards, according to the judgment of the examiner.

‡ Troy Weight, Avoirdupois Weight, Long Measure, and Time Measure will here be considered sufficient. Questions may be set in Dry and Square Measure in the higher Standards.

II.—Special Report of Instruction in History, Geography, and other Subjects.

III.—Table marking Degrees of Progress as shown by the Examination Books.

Class.	Number of Books examined.	Dictation.				Writing.				Arithmetic.			
		Great Progress.	Progress.	Stationary.	Gone back.	Great Progress.	Progress.	Stationary.	Gone back.	Great Progress.	Progress.	Stationary.	Gone back.
Special - - -													
1st - - -													
2nd - - -													
3rd - - -													
4th - - -													
5th - - -													
6th - - -													
Total - -													
Total per cent. of those examined													

In the entries of these Tables the examination books of those not present, as well as of those present at the examination, are to be included.

App. VI. Form A.

App. VI. Form A.

GENERAL REPORT.

I. On the attainments of the pupils, and on their progress* - - - - - -

II. On the regularity or otherwise of the attendance at school, as shown by the register, and whether the register is properly kept - -

III. On the discipline of the school - -

IV. On the sufficiency and condition of the school books and school materials - - -

V. On the condition of the school rooms, and their sufficiency, or otherwise, for the wants of the school - - - - -

VI. On the character and efficiency of the schoolmaster and his assistants - - -

* Should the results be bad, the schoolmaster's written explanation should be appended, and the assistant inspector will write his comments thereon in this place, and on the fourth page, if necessary.

VII.—CERTIFICATES of EDUCATION.

—	Number of Certificates in Possession.*						Numbers recommended to be granted on this occasion.†						Remarks.
	1st.		2nd.		3rd.		1st.		2nd.		3rd.		
	a.‡	b.	a.	b.	a.	b.	a.	b.	a.	b.	a.	b.	
Serjeants -													
Corporals -													
Drummers -													
Privates -													
Total -													

* No man is to be considered as holding more than one certificate.

† The First Class Certificate is to correspond to Standard A. in Reading, Dictation, and Arithmetic, and is to include also general Geography and English History. The Second Class Certificate is to correspond to Standard B. in Reading, Dictation, and Arithmetic; and the Third Class Certificate to Standard C. in Reading and Dictation, and to Standard D. in Arithmetic.

‡ Column a. is to contain men who have received any portion of their education in the regimental school; column b. is to contain men who have never attended the regimental school.

FURTHER REMARKS on the above or any other subject which it is thought desirable to bring to the notice of the Council.

B.

Regiment of _____ commanded by _____

REPORT of the Grown Children's School after Inspection by _____ on the _____ 186 ; for the Information of the Council of Military Education.

Station _____. Schoolmaster _____, Class _____.

Assistants { _____ _____ _____

I.—TABLE showing DEGREES of ATTAINMENT.

Class.*	Numbers present.	Number who have attained the Standard of Reading denoted by †				Number who have attained the Standard of Dictation denoted by †				Number who have attained the Standard of Arithmetic denoted by †					Number whose Knowledge is above or below the Standard.		
		A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.	E.		Above A.	Below D. or E.
Special - -																	
1st - - -															Reading -		
2nd - - -																	
3rd - - -															Dictation -		
4th - - -																	
5th - - -															Arithmetic -		
6th - - -																	
Total - -																	
Total per cent. of those examined - }																	

* The classes referred to in this Table and in that of the Degrees of Progress are to consist of the pupils who are ordinarily taught the same subjects together, the first being the highest of the numbered classes.

† Reading and Dictation.—Standard A.: Supplement to the Fourth Book of Lessons; Standard B.: Fourth Book of Lessons; Standard C.: Sequel to the Second Book of Lessons; Standard D.: Second School Book.

Arithmetic.—Standard A.: Vulgar Fractions, Decimals, Compound Proportion; Standard B.: Practice, Simple Proportion, Interest; Standard C.: The four Compound Rules,‡ and Reduction of Weights and Measures; Standard D.: The four Compound Rules and Reduction of Money; Standard E.: Simple Multiplication and Division (Long).

A pupil is to be classed under any Standard when he does fairly any portion of the work denoted by that Standard. Pupils whose work is indifferent or bad will be reckoned under one of the lower Standards, according to the judgment of the examiner.

‡ Troy Weight, Avoirdupois Weight, Long Measure, and Time Measure will here be considered sufficient. Questions may be set in Dry and Square Measure in the higher Standards.

II.—Special Report of Instruction in History, Geography, and other Subjects.

III.—Table marking Degrees of Progress as shown by the Examination Books.

Class.	Number of Books examined.	Dictation.				Writing.				Arithmetic.			
		Great Progress.	Progress.	Stationary.	Gone back.	Great Progress.	Progress.	Stationary.	Gone back.	Great Progress.	Progress.	Stationary.	Gone back.
Special - - -													
1st - - -													
2nd - - -													
3rd - - -													
4th - - -													
5th - - -													
6th - - -													
Total - -													
Total per cent. of those examined -													

In the entries of these Tables the examination books of those not present, as well as of those present, at the examination are to be included.

GENERAL REPORT.

APP. VI.
Form B.

I. With respect to the Bible lesson - -

II. Remarks on the attainments of the pupils and on their progress* - - - -

III. On the regularity or otherwise of the attendance at school as shown by the register, and whether the register is properly kept - -

IV. On the discipline of the school, and on the manners, cleanliness, tidiness, and general appearance of the children - - -

V. On the sufficiency and condition of the school books and school materials - - -

VI. On the condition of the school rooms, and their sufficiency, or otherwise, for the wants of the school - - - - -

VII. On the character and efficiency of the schoolmaster and his assistants - -

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*Should the results be bad, the schoolmaster's written explanation should be appended, and the assistant inspector will write his comments thereon on this place, and on the fourth page, if necessary.

FURTHER REMARKS on the above or any other subject which it is thought desirable to bring to the notice of the Council.

App. VI.
Form C.

C.

_____Regiment of_____commanded by_____
Report on the Infants and Industrial School after inspection by _____, on the _____186___, for the information of the Council of Military Education.
Station _____.

Schoolmistress_____Class_____
Assistant Schoolmistress _____
Pupil-teacher _____
_____
Monitress_____
_____

I.

Numbers present at the Examination.	Boys.	Girls.	Total.

Numbers of infant children of proper age for school in the regiment, boys_____, girls_____.

II.

Remarks on the Instruction in

Reading.	Writing.	Arithmetic.	Objects.	Singing.	Any other Subjects.	Physical Exercises.

III.

Remarks on the Industrial Work.

Hemming.	Sewing.	Darning.	Cutting and Making	
			Under-Clothes.	Dresses.

General Report.

1. On the religious instruction - - -
2. On the general instruction, discipline, and efficiency of the school - - -
3. On the manners, cleanliness, tidiness, and general appearance of the children - -
4. On the sufficiency and condition of the school books and school materials - - -
5. On the condition of the school-room, and its sufficiency or otherwise for the wants of the school - - - - - -
6. On the regularity of attendance as shown by the register, and whether the registers are properly kept - - - - -
7. On the character and efficiency of the schoolmistress - - - - -
8. Report on the assistant schoolmistresses and pupil-teachers - - - - -

D.

Regiment of _____ commanded by _____

Report of the _____ School after Examination by Schoolmaster _____ on the ____ day of _____ 186___ ; for the information of the Council of Military Education.

Station _____ Schoolmaster _____, Class ____.

Assistants { _____ _____ _____

I.—Table showing Degrees of Attainment.

Class.*	Numbers examined.	Number who have attained the Standard of Reading denoted by †				Number who have attained the Standard of Dictation denoted by †				Number who have attained the Standard of Arithmetic denoted by †					Number whose Knowledge is above or below the Standards.		
		A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.	E.		Above A.	Below D. or E.
Special - -															Reading -		
1st - - -																	
2nd - - -															Dictation -		
3rd - - -																	
4th - - -															Arithmetic -		
5th - - -																	
6th - - -																	
Total - -																	
Total per cent of those examined -																	

* The classes referred to in this Table and in that of the Degrees of Progress are to consist of pupils who are ordinarily taught the same subjects together, the first being the highest of the numbered classes.

† *Reading and Dictation.*—Standard A.: Supplement to the Fourth Book of Lessons; Standard B.: Fourth Book of Lessons; Standard C.: Sequel to the Second Book of Lessons; Standard D.: Second Book.

Arithmetic.—Standard A.: Vulgar Fractions, Decimals, Compound Proportion; Standard B.: Practice, Simple Proportion, Interest, with application to Regimental Savings' Bank Accounts; Standard C.: the four Compound Rules‡ and Reduction of Weights and Measures, with application to Mess Book and Ledger Accounts; Standard D.: The four Compound Rules and Reduction of Money, with application to Mess Book and Ledger Accounts; Standard E.: Simple Multiplication and Division (Long).

Instructions.

This form of report is to be used by the schoolmaster for his half-yearly examinations, and for the examination during the month immediately preceding the inspection by the assistant inspector.

If the inspection takes place less than two months after the half-yearly examination, the schoolmaster's examination previous to inspection may be dispensed with.

If the inspection takes place less than two months before the half-yearly examination, the latter may be dispensed with.

The report of the half-yearly examinations is to be sent to the Secretary of the Council of Military Education, and a duplicate to the assistant inspector.

‡ Troy Weight, Avoirdupois Weight, Long Measure, and Time Measure will here be considered sufficient. Questions may be set in Dry and Square Measure in the higher Standards.

II.—Special Report of Instruction in History, Geography, and other Subjects.

III.—Table marking Degrees of Progress as shown by the Examination Books.

Class.	Number of Books examined.	Dictation.				Writing.				Arithmetic.			
		Great Progress.	Progress.	Stationary.	Gone back.	Great Progress.	Progress.	Stationary.	Gone back.	Great Progress.	Progress.	Stationary.	Gone back.
Special - -													
1st - - -													
2nd - - -													
3rd - - -													
4th - - -													
5th - - -													
6th - - -													
Total - -													
Total per cent. of those examined - }													

In the entries of these Tables the examination books of those not present, as well as of those present, at the examination are to be included.

Report of Progress of Non-commissioned Officers and Soldiers under Special Instruction for Admission to the Normal School, or for the Duties of Detachment Schoolmaster, in accordance with Article 46 of the School Regulations.

General Report.

I certify that I have carefully examined the school under my charge, and that the above Tables and Report represent, to the best of my judgment, the attainments and progress of the pupils.

_____ Schoolmaster.

N.B.—Remarks by commanding officer on the back of this Report.

E.

Abstract of Report by Assistant Inspector of Army Schools.

Abstract of Report of the Examination of the School of the held on the 186 , for the information of the Officer Commanding.

I.—Degrees of Attainment.

Standard.	Number passed in		
	Reading.	Dictation.	Arithmetic.
A			
B			
C			
D			
E			
Total number examined			

Reading and Dictation.—Standard A.: Supplement to the Fourth Book of Lessons; Standard B.: Fourth Book of Lessons; Standard C.: Sequel to the Second Book of Lessons; Standard D.: Second School Book.

Arithmetic.—Standard A.: Vulgar Fractions, Decimals, Compound Proportion; Standard B.: Practice, Simple Proportion, Interest, with application to Regimental Savings Bank Accounts; Standard C.: the four Compound Rules,* and Reduction of Weights and Measures, with application to Mess Book and Ledger Accounts; Standard D.: the Four Compound Rules and Reduction of Money, with application to Mess Book and Ledger Accounts; Standard E.: Simple Multiplication and Division (Long).

Troy Weight, Avoirdupois Weight, Long Measure, and Time Measure will here be considered sufficient. Questions may be set in Dry and Square Measure in the higher Standards.

App. VI. Form E.

App. VI.
Form E.

II.—History, Geography, and other Subjects.

III.—Table of Degrees of Progress.

Number examined.	Dictation.				Writing.				Arithmetic.			
	Great Progress.	Progress.	Stationary.	Gone back.	Great Progress.	Progress.	Stationary.	Gone back.	Great Progress.	Progress.	Stationary.	Gone back.

General Reports.

I. Remarks on the attainments of the pupils, and their progress - - - - -

II. On the regularity or otherwise of the attendance at school, as shown by the register, and whether the register is properly kept - -

III. On any other matters connected with the school - - - - - -

Certificates of Education.

Nominal list of non-commissioned officers and soldiers recommended for 1st, 2nd, and 3rd class certificates respectively.

F.

Library and Recreation Rooms.

Report on the Garrison Library at_____, and on the Recreation Rooms of the_____ ___ _.

Library.

1. Whether the room is suitable, and the books kept in good order - - - -

2. General remarks - - - -

Recreation Rooms of the_____ _____

1. Average daily attendance - - -

2. Whether the rooms are well warmed, lighted, and ventilated, and comfortably furnished -

3. Whether the commanding officer has any suggestions to offer - - - -

4. General remarks - - - -

App. VI.
Form G.

G.

NOTICE OF INSPECTION.

_____ 18 _____

Sir,

I have the honour to inform you that, in conformity with the Army School Regulations, I propose to inspect the Schools of the_____ under your command in about a month from this date, and at the same time to visit the Garrison Library and Regimental Recreation Rooms. I will apprize you of the precise date in a further communication.

I shall be obliged by your informing the schoolmaster of my intended inspection, in order that he may in the meantime examine each adult and grown child on the school books, in accordance with the Horse Guards Order of the , and prepare the usual Form showing the results of the examination.

An abstract of my Report to the Council of Military Education will be furnished to you. I shall have great pleasure in conferring with you, or with any officer whom you may depute, on any matter connected with the Schools, &c.

I have the honour to be,

Sir,

Your obedient Servant,

Assistant Inspector of Army Schools.

The Officer Commanding

_____ _____

_____

Monthly School Report.

W.O. Form 367. App. VI. No. 2.

_____ Regiment.

Station_____

SCHOOL REPORT for the Month of_____ 186 ____.

Last Inspected_____ by_____

Number on School Books. { Head Quarters – – – / Detachment at_____ / „ at_____ / „ at_____ / Of other Corps* – – –

HEAD QUARTER SCHOOLS.

Average† attendance of ordinary Classes –

Ditto Special Class – –

Average‡ number of hours of School attendance per man weekly, not including Special Class –

Ditto of Special Class –

CHILDREN.

No. on School Books. { Head Quarters – { Of N.C.O. & Men / Of Pensioners, &c. / Detachment at_____ { Of N.C.O. & Men / Of Pensioners, &c. / „ at_____ { Of N.C.O. & Men / Of Pensioners, &c. / Of other Corps* – – – –

Average† attendance at Head Quarters School

INDUSTRIAL SCHOOL.

Number on School Books. { Head Quarters – – – / Detachment at_____ / „ at_____ / Of other Corps – – –

Average† attendance at Head Quarters School

ABSTRACT.

	Sergeants.	Corporals.	Privates.	Drummers.	Total.

	Grown Children.		Infants.		Total.
	Boys.	Girls.	Boys.	Girls.	

REMARKS.

The conduct and attention of the classes have been_____

Their general progress has been_____

Number and Subjects of Lectures delivered during the Month, and by whom.

HOURS OF ATTENDANCE.

Special Class { from___ to___ / from___ to___

N.C. Officers from___ to___

Privates – from___ to___

Drummers – from___ to___

Grown Children { from___ to___ / from___ to___

Infant and Industrial School. { from___ to___ / from___ to___

Private Tuition—whether any is given?

RELIGIOUS INSTRUCTION.

	At what Times.	
By Chaplain –		
By R.C. Chaplain		
By Presbyterian Minister –		

Report on the 4th-class Schoolmaster (if any)

Class.	Schoolmasters, or Acting Schoolmasters, and Assistants.	Employed From	Employed To	Pay per Day.	Amount.	Class.	Name of Schoolmistress, Pupil-teachers, and Monitresses.	Rate of Pay.	Remarks

* A fly-leaf is to be appended showing the numbers from each corps.

† This average is to be obtained by adding the numbers of entries of attendances in the register, dividing by the number of times the school was open for the classes specified.

‡ This average is to be obtained by adding the number of hours actually attended by adults weekly, and dividing by the number of those adults who attended.

Schoolmaster.

DISTRIBUTION of CHILDREN attending this School, and the Fees paid by them during the Month.

Children of	Rate per Month.	Boys.	Girls.	Amount Credited to the Public.	Remarks.
				£ s. d.	
Regiment – –	1*d.*				
Do. – –	1½*d.*				
Do. – –	2*d.*				
Other Corps –	1*d.*				
Do. – –	1½*d.*				
Do. – –	2*d.*				
Officers – –	5*s.*				
Do. – –	2*s.* 6*d.*				
Civilians – –	5*s.*				
Deceased Soldiers	1*d.*				
Militia Staff –	,,				
Warders of Military Prisons –	,,				
Barrack Serjeants	,,				
Pensioners, when in Garrison or Regl. employ –	,,				
Do. – –	1½*d.*				
Do. – –	2*d.*				
Pensioners, when not in Garrison or Regl. employ	3*d.* per week.				
Officers' Private Servants –	Do.				
Canteen Keepers –	Do.				
Coast Guardsmen	Do.				
Foremen, Labourers, and others employed in the Garrison, on duties connected therewith – –	Do.				
Soldiers serving abroad, who have been left at home on the embarkation of their Fathers –	Free				
Total –					

N.B.—Charges for broken periods to be explained in the Column of Remarks.

_____ Regiment.

Station _____

SCHOOL REPORT.

for the Month of _____ 18___.

W.O. Form 367.

Remarks by the Commanding Officer as to the Conduct and Ability of the Schoolmaster and his Assistants, and of the Schoolmistress and her Assistants; and upon any other matter connected with the Schools to which he may wish to call attention, in forwarding the within Report.

The Commanding Officer is also to state whether the Schoolmaster, or the Schoolmistress, has been absent during any part of the month, and, if so, for what period and on what account.*

_____ *Officer Commanding.*

_____ *Station.*

_____ *Date.*

* These Remarks should be in the handwriting of the Commanding Officer.

This part of the Report is on no account to be left blank.

V. R.

FIRST-CLASS CERTIFICATE OF EDUCATION.

_____ Assistant Inspector of Army Schools having certified that _____ of the _____ under my Command, can read fluently any Book of ordinary dificulty; can write correctly a passage dictated from the same; understands the mode of keeping Mess Book, Ledger, and Regimental Savings Bank Accounts; can work Vulgar and Decimal Fractions and Compound Proportion; and has a fair knowledge of general Geography and of English History; I hereby grant him a Certificate of Education of the First Class.

_____
Commanding.

_____ 186__.

V. R.

SECOND-CLASS CERTIFICATE OF EDUCATION.

_____ Assistant Inspector of Army Schools having certified that _____ of the _____ under my Command, can read a Book of moderate difficulty; can write fairly a passage dictated from the same; understands the mode of keeping Mess Book, Ledger, and Regimental Savings Bank Accounts; and can work questions in Practice, Simple Proportion, and Interest; I hereby grant him a Certificate of Education of the Second Class.

_____
Commanding.

_____ 186__.

V. R.

THIRD-CLASS CERTIFICATE OF EDUCATION.

_____ Assistant Inspector of Army Schools having certified that _____ of the _____ under my Command, can read Easy Narratives, can write fairly an easy passage dictated from the same, and can work, in Arithmetic, the four Compound Rules and Reduction of Money; I hereby grant him a Certificate of Education of the Third Class.

_____
Commanding.

_____ 186 .

App. VII.

Appendix VII.

Table showing the Numbers of Adults present at the last Inspection, together with the Average Numbers on the School Books during the last Twelve Months.

Regiments.	Average No. on School Books.	No. at the last Inspection.	Regiments.	Average No. on School Books.	No. at the last Inspection.
1st Life Guards -	33	Nil.	2nd Bt. 22nd Foot -	273	58
2nd „ - -	44	31	2nd Bt. 23rd „ -	457	46
Royal Horse Guards -	36	31	1st Bt. 24th „ -	157	73
4th Dragoon Guards -	30	28	1st Bt. 25th „ -	133	84
5th „ -	50	27	2nd Bt. 25th „ -	107	51
6th „ -	250	91	26th Foot - -	303	—
1st Dragoons - -	73	52	29th „ - -	133	59
2nd „ - -	31	Nil.	32nd „ - -	121	31
3rd Hussars - -	85	84	36th „ - -	349	156
4th „ - -	122	56	37th „ - -	239	70
5th Lancers - -	50	—	41st „ - -	154	80
9th „ - -	74	25	45th „ - -	208	139
10th Hussars - -	121	100	49th „ - -	135	76
11th „ - -	31	34	53rd „ - -	214	56
12th „ - -	97	68	55th „ - -	213	63
13th „ - -	88	67	58th „ - -	196	180
14th „ - -	84	44	59th „ - -	273	123
15th „ - -	69	41	1st Bt. 60th Rifles -	158	121
16th Lancers - -	66	82	2nd Bt. 60th „ -	275	90
18th Hussars - -	30	12	64th Foot - -	331	127
			73rd „ - -	192	118
Total - - -	1,464	873	75th „ - -	150	62
			76th „ - -	204	107
			78th „ - -	429	195
2nd Bt. Gren. Guards	321	141	83rd „ - -	177	60
3rd „	208	117	84th „ - -	408	63
1st Bt. Cold. Guards -	148	72	85th „ - -	93	34
2nd „ -	269	136	86th „ - -	170	—
1st Bt. Scots Fus. Gds.	169	145	87th „ - -	246	98
			92nd „ - -	109	83
Total - - -	1,115	611	100th „ - -	253	33
			4th Bt. Rifle Brig. -	231	52
2nd Bt. 1st Foot -	180	60	Total - - -	11,286	4,179
1st Bt. 2nd „ -	352	132			
2nd Bt. 2nd „ -	466	112			
1st Bt. 3rd „ -	250	88	1st Depôt Battalion -	107	95
2nd Bt. 3rd „ -	266	70	2nd „ -	111	83
1st Bt. 5th „ -	184	63	3rd „ -	149	53
1st Bt. 6th „ -	115	124	4th „ -	194	103
2nd Bt. 7th „ -	188	24	5th „ -	90	41
1st Bt. 8th „ -	234	108	6th „ -	199	120
2nd Bt. 8th „ -	469	49	7th „ -	156	—
1st Bt. 10th „ -	184	71	8th „ -	169	54
1st Bt. 11th „ -	141	107	9th „ -	164	93
2nd Bt. 12th „ -	130	107	10th „ -	133	48
2nd Bt. 15th „ -	233	67	11th „ -	201	25
2nd Bt. 20th „ -	530	269	12th „ -	161	83
1st Bt. 22nd „ -	273	140	13th „ -	203	48

Regiments.	Average No. on School Books.	No. at the last Inspection.	Regiments.	Average No. on School Books.	No. at the last Inspection.
14th Depôt Battalion	245	94	2nd Brig. Royal Art.	195	49
15th „	189	132	3rd „	91	49
16th „	209	120	5th „	124	3
17th „	518	304	7th „	100	54
18th „ }	219	231	9th „	306	91
19th „ }			13th „	142	28
20th „	158	151	Depôt Brig., 1st Div.	229	45
22nd „	244	154	„ 2nd „	364	174
23rd „	227	118	„ 3rd „	161	143
Cavalry Depôt, Canterbury.	71	40	Depôt Royal Horse Art., Canterbury.	102	45
Cavalry Depôt, Maidstone.	13	19			
Depôt Foot Guards	170	107	Total	2,205	850
Total	4,300	2,316	ROYAL ENGINEERS.		
			17th Company	80	70
Royal Horse Artillery, Woolwich.	286	137	3rd, 27th, and 33rd Companies.	47	29
1st Brig. Royal Art.	105	33	Total	127	99

APPENDIX VIII.

TABLE showing the STATE of EDUCATION in the ADULTS' SCHOOLS.

Regiment.	Reading.			Writing.		Arithmetic, &c.						
	Letters and Monosyllables.	Easy Narratives.	Books of General Information.	From Copies.	From Dictation.	Simple Rules.	Compound Rules.	Proportion and Practice.	Fractions, Decimals, and Higher Rules.	Geography.	Grammar.	History.
1st Life Guards	5	16	12	32	25	16	11	5	1	—	—	—
2nd „	2	7	23	32	30	9	12	11	—	—	—	—
Royal Horse Guards	3	22	13	25	35	22	13	—	—	—	—	—
1st Dragoon Guards }	India.											
2nd „ }												
3rd „ }												
4th „	2	12	25	25	10	26	13	—	—	—	—	—
5th „	—	8	25	2	31	4	14	5	4	—	—	—
6th „	55	64	156	275	220	4	185	21	18	67	—	—
7th „	India.											
1st Dragoons	10	9	37	51	32	22	25	2	7	—	—	—
2nd „	16	15	46	21	57	36	27	10	5	24	24	24
3rd Hussars	3	28	74	36	69	25	52	3	24	25	33	25
4th „	11	44	27	82	82	2	57	19	12	—	25	—
5th Lancers	9	18	23	50	26	27	18	—	5	—	—	—
6th Dragoons }	India.											
7th Hussars }												
8th „ }												
9th Lancers	22	22	31	43	32	65	3	2	5	—	—	—

App. VIII.

Regiments.	Reading.			Writing.		Arithmetic, &c.						
	Letters and Monosyllables.	Easy Narratives.	Books of General Information.	From Copies.	From Dictation.	Simple Rules.	Compound Rules.	Proportion and Practice.	Fractions, Decimals, and Higher Rules.	Geography.	Grammar.	History.
10th Hussars	25	67	63	155	63	94	55	4	2	—	—	—
11th „	4	9	30	21	22	23	20	—	—	—	—	—
12th Lancers	3	14	71	34	71	14	53	19	—	55	24	—
13th Hussars	9	51	14	20	54	42	26	1	5	11	11	11
14th „	—	27	34	61	47	22	22	10	7	—	—	—
15th „	7	24	13	44	13	16	13	—	—	—	—	—
16th Lancers	10	34	69	113	89	59	54	—	—	—	—	—
17th „	India.											
18th Hussars	2	6	5	13	8	1	10	2	—	—	—	—
19th „	India.											
20th „												
21st „												
1st Batt. Mil. Train	Not inspected. Mixed schools.											
2nd „												
3rd „	Canada.											
4th „	New Zealand.											
5th „	37	82	34	130	31	106	35	12	—	14	—	14
6th „	35	76	29	117	23	105	25	10	—	14	—	14
Total	233	573	820	1252	1039	634	708	134	95	196	117	74
1st Bt. Gren. Guards	Canada.											
2nd „	4	37	290	254	213	41	182	52	56	109	—	108
3rd „	42	43	150	76	159	116	61	3	45	69	—	20
1st Bt. Cold. Guards	33	42	89	75	89	75	84	5	—	128	—	—
Detachment	—	18	23	28	13	28	11	2	—	—	—	—
2nd „	43	81	153	277	277	43	190	19	25	—	—	—
1st S. F. Guards	30	54	112	147	151	46	97	—	26	30	—	—
2nd „	Canada.											
Total	152	275	817	857	912	349	625	81	152	336	—	128
1st Batt. 1st Foot	India.											
2nd „	24	32	102	39	119	61	31	61	17	—	—	—
1st Batt. 2nd Foot	34	114	189	136	201	252	61	—	24	—	—	—
2nd „	132	104	339	347	354	137	288	38	12	63	63	63
1st Batt. 3rd Foot	90	69	54	223	200	52	96	15	26	—	—	—
2nd Batt. 3rd Foot	15	73	135	223	184	115	76	11	21	18	—	18
1st Batt. 4th Foot	India.											
2nd Batt. 4th Foot	Corfu.											
1st Batt. 5th Foot	12	33	123	24	117	32	58	40	—	61	—	—
2nd Batt. 5th Foot	Cape of Good Hope.											
1st Batt. 6th Foot	91	9	86	103	83	72	75	—	2	—	—	—
2nd Batt. 6th Foot	Jamaica.											
1st Batt. 7th Foot	India.											
2nd Batt. 7th Foot	18	48	21	29	59	17	28	10	40	61	35	35
1st Batt. 8th Foot	66	91	73	242	93	45	44	27	52	63	42	63
2nd Batt. 8th Foot	56	167	161	189	248	216	147	19	2	30	—	—
1st Batt. 9th Foot	Corfu.											
2nd Batt. 9th Foot												
1st Batt. 10th Foot	47	49	92	188	141	188	168	—	—	—	—	—
2nd Batt. 10th Foot	Cape.											
1st Batt. 11th Foot	7	97	41	145	121	93	38	10	4	—	—	—
2nd Batt. 11th Foot	Cape.											
1st Batt. 12th Foot	New Zealand.											
2nd Batt. 12th Foot	14	107	38	105	108	50	38	55	16	22	—	—
1st Batt. 13th Foot	India.											
2nd Batt. 13th Foot	Mauritius.											
1st Batt. 14th Foot	Jamaica.											
2nd Batt. 14th Foot	New Zealand.											
1st Batt. 15th Foot	New Brunswick.											
2nd Batt. 15th Foot	50	60	171	50	231	151	75	125	31	231	—	231
1st Batt. 16th Foot	Canada.											
2nd Batt. 16th Foot	Nova Scotia.											

Regiment.	Reading.			Writing.		Arithmetic, &c.						
	Letters and Monosyllables.	Easy Narratives.	Books of General Information.	From Copies.	From Dictation.	Simple Rules.	Compound Rules.	Proportion and Practice.	Fractions, Decimals, and Higher Rules.	Geography.	Grammar.	History.
1st Batt. 17th Foot	Canada.											
2nd Batt. 17th Foot	Nova Scotia.											
1st Batt. 18th Foot	India.											
2nd Batt. 18th Foot	New Zealand.											
1st Batt. 19th Foot	India.											
2nd Batt. 19th Foot	Birmah.											
1st Batt. 20th Foot	India.											
2nd Batt. 20th Foot	75	152	328	219	336	256	149	35	53	—	—	—
1st Batt. 21st Foot	Barbadoes.											
2nd Batt. 21st Foot	India.											
1st Batt. 22nd Foot	14	85	74	173	134	94	48	29	4	25	25	25
2nd Batt. 22nd Foot	31	145	74	250	216	151	72	—	27	33	33	—
1st Batt. 23rd Foot	India.											
2nd Batt. 23rd Foot	94	194	97	185	197	47	284	7	—	97	—	—
1st Batt. 24th Foot	38	68	68	175	137	85	46	25	18	—	—	—
2nd Batt. 24th Foot	Mauritius.											
1st Batt. 25th Foot	16	61	88	162	126	48	49	50	15	99	4	84
2nd Batt. 25th Foot	30	50	91	171	121	72	77	20	2	—	—	—
26th Foot	60	141	257	458	457	201	87	48	73	—	—	—
27th „	India.											
28th „												
29th „	15	6	62	83	65	23	35	15	10	63	31	56
30th „	Canada.											
31st „	33	93	48	93	81	119	34	—	13	—	—	—
32nd „	14	89	29	132	132	45	58	—	29	31	15	—
33rd „	India.											
34th „												
35th „												
36th „	34	75	164	162	110	104	124	16	27	113	13	—
37th „	53	89	85	227	137	78	130	19	—	—	—	—
38th „	India.											
39th „	Bermuda.											
40th „	New Zealand.											
41st „	46	40	31	123	43	45	11	11	6	38	18	29
42nd „	India.											
43rd „	New Zealand.											
44th „	India.											
45th „	19	19	176	47	167	74	53	37	51	76	—	11
46th „	India.											
47th „	Canada.											
48th „	India.											
49th „	10	38	87	135	19	47	12	48	7	—	—	—
50th „	New Zealand.											
51st „	India.											
52nd „												
53rd „	39	97	24	94	65	111	35	13	5	—	—	—
54th „	—	—	—	—	—	—	—	—	—	—	—	—
55th „	23	63	145	231	362	96	80	49	16	—	—	—
56th „	—	—	—	—	—	—	—	—	—	—	—	—
57th „	New Zealand.											
58th „	38	76	189	184	129	136	114	63	121	52	—	18
59th „	29	115	140	284	164	111	140	7	26	—	—	—
60th Rifles. 1st Battalion	61	69	149	279	279	151	75	26	24	83	41	41
60th Rifles. Detachment	9	41	27	77	32	52	17	4	2	26	—	—
60th Rifles. 2nd „	76	67	165	143	162	201	104	—	—	—	—	—
60th Rifles. 3rd „	Birmah.											
60th Rifles. 4th „	Canada.											
61st Foot	Last inspected 13th March, 1862, Jersey.											
62nd „	Canada.											
63rd „												
64th „	176	53	117	346	142	257	81	37	21	—	—	—
65th „	New Zealand.											
66th „	India.											
67th „	China.											
68th „	New Zealand.											
69th „	India.											

App. VIII.

Regiments.	Reading.			Writing.		Arithmetic, &c.						
	Letters and Monosyllables.	Easy Narratives.	Books of General Information.	From Copies.	From Dictation.	Simple Rules.	Compound Rules.	Proportion and Practice.	Fractions, Decimals, and Higher Rules.	Geography.	Grammar.	History.
70th Foot	New Zealand.											
71st "	India.											
72nd "												
73rd "	34	79	138	52	199	46	148	24	33	—	—	—
74th "	India.											
75th "	15	66	58	81	58	85	21	12	21	—	—	—
76th "	12	51	140	203	203	33	86	25	30	—	—	—
77th "	India.											
78th "	34	92	247	373	209	130	124	41	25	64	—	—
79th "	India.											
80th "												
81st "												
82nd "												
83rd "	37	17	23	51	26	29	24	1	23	14	14	—
84th "	77	95	386	436	337	311	147	86	14	—	—	—
85th "	5	18	34	57	36	20	14	13	—	—	—	—
86th "	10	154	27	191	181	62	104	27	—	—	—	—
87th "	98	137	119	354	122	—	126	44	20	—	—	—
88th "	India.											
89th "												
90th "												
91st "												
92nd "	4	27	97	128	97	64	26	24	14	—	—	—
93rd "	India.											
94th "												
95th "												
96th "	Cape.											
97th "	India.											
98th "												
99th "	China.											
100th "	94	96	100	65	85	174	55	32	—	—	—	—
101st "	India.											
102nd "												
103rd "												
104th "												
105th "												
106th "												
107th "												
108th "												
109th "												
R. B. 1st Battalion												
R. B. 2nd "												
R. B. 3rd "												
R. B. 4th "	6	33	115	15	139	26	95	18	15	140	87	140
1st W. I. Regiment	Not inspected.											
2nd "												
3rd "												
4th "												
5th "												
Ceylon Rifles												
Cape M. Rifles												
Canadian Rifles												
Do. Newfoundland												
Malta Fencibles												
Total	2115	3794	5801	8482	7854	5575	3098	1307	982	1503	421	814
1st Depôt Battalion	26	27	49	34	28	47	31	14	10	19	—	—
2nd "	6	31	56	23	70	11	57	8	12	25	—	—
3rd "	10	32	75	42	75	34	51	13	6	28	28	28
4th "	42	63	125	98	132	79	100	36	15	—	—	—
5th "	—	14	28	8	34	11	16	10	5	—	—	—

Regiment.	Reading.			Writing.		Arithmetic, &c.						
	Letters and Monosyllables.	Easy Narratives.	Books of General Information.	From Copies.	From Dictation.	Simple Rules.	Compound Rules.	Proportion and Practice.	Fractions, Decimals, and Higher Rules.	Geography.	Grammar.	History.
6th Depôt Battalion	12	39	108	159	147	78	23	41	17	58	—	—
7th „	9	37	84	87	113	40	45	29	16	—	—	—
8th „	35	36	146	47	161	36	92	2	15	—	—	—
9th „	1	13	102	114	101	28	61	36	10	—	—	—
10th „	76	68	77	125	96	157	37	20	7	24	—	—
11th „	—	33	109	142	133	20	47	50	25	103	19	47
12th „	135	43	43	221	89	84	29	23	14	14	7	—
13th „	45	111	100	256	256	132	42	60	22	153	123	183
14th „	32	74	111	217	217	104	60	34	19	111	111	111
15th „	25	47	136	208	128	49	67	1	59	18	18	8
16th „	45	47	164	256	164	92	139	37	8	—	—	—
17th „	187	270	117	614	386	140	230	—	43	13	13	13
18th „	74	72	108	254	127	49	132	20	13	—	13	—
19th „	79	62	67	205	73	55	110	10	3	—	3	—
20th „	53	69	113	92	143	53	138	19	25	16	—	8
22nd „	40	65	121	226	121	65	91	18	12	121	—	—
23rd „	23	65	125	213	179	79	84	30	20	113	22	22
Cav. Dep. Maidstone	3	1	17	21	12	5	13	1	2	—	—	—
„ Canterbury	4	24	31	24	35	36	16	4	2	—	—	—
Total	962	1340	2212	3656	3060	1484	1721	518	380	816	357	450
Brigade of Guards, St. John's Wood.	70	37	33	73	67	70	39	27	4	129	—	—
ROYAL ARTILLERY.												
1st Horse Brigade	30	85	106	46	163	88	77	13	21	—	—	—
2nd „	India.											
3rd „												
4th „												
5th „												
1st Brigade	—	2	166	168	168	9	71	38	50	148	—	148
2nd „	173	515	274	962	528	302	414	7	61	—	—	—
3rd „	33	31	48	33	52	38	29	2	7	27	—	20
4th „												
5th „	24	52	41	24	96	18	61	24	17	41	—	—
6th „	3	19	48	4	66	4	16	20	9	9	—	—
7th „	17	34	89	140	140	51	43	7	39	89	—	89
8th „												
9th „	34	93	115	242	203	76	108	58	—	—	—	—
10th „	Canada.											
11th „												
12th „	India.											
13th „	19	64	74	157	138	33	80	44	—	—	—	—
14th „												
15th „												
16th „												
17th „												
18th „												
19th „												
20th „	India.											
21st „												
22nd „												
23rd „												
24th „												
25th „												
Depôt Royal Artillery. 1st Division, Sheerness.	22	80	86	188	149	93	—	56	—	126	—	—
Depôt Royal Artillery. 2nd Division, Woolwich.	85	62	245	147	207	89	177	25	42	91	33	33
Depôt Royal Artillery. 3rd Division, Warley.	17	58	80	155	110	57	51	18	—	81	—	81
R. A. at Ballincollig	2	25	33	58	50	14	10	19	8	2	—	—
„ at Canterbury	22	17	57	76	60	93	3	—	—	—	—	—

App. IX.

Regiment.	Reading.			Writing.		Arithmetic, &c.						
	Letters and Monosyllables.	Easy Narratives.	Books of General Information.	From Copies.	From Dictation.	Simple Rules.	Compound Rules.	Proportion and Practice.	Fractions, Decimals, and Higher Rules.	Geography.	Grammar.	History.
8th Brigade, Dublin	20	33	41	67	56	18	41	16	5	25	25	—
Battery, 9th Brigade, Leith Fort.	7	19	18	44	21	11	18	11	4	—	1	—
Battery at Newbridge	4	10	28	42	20	6	42	—	—	—	—	—
Total - -	512	1199	2550	2553	2232	1000	1241	351	259	639	59	371
ROYAL ENGINEERS.												
Aldershot - -	16	134	131	150	131	142	61	64	14	—	—	—
Chatham - -	30	51	20	682	646	104	90	115	135	—	—	—
Gibraltar - -	—	—	40	2	37	—	9	18	15	—	—	—
Curragh - -	3	46	20	81	65	40	11	14	16	42	6	—
Total - -	49	231	211	915	879	286	171	211	180	42	6	—

APPENDIX IX.

TABLE showing the Average Number of Non-commissioned Officers, Drummers, and Trumpeters whose Names were on the School Books during the Periods specified in the last Column, with the Average Daily Attendance for the Official Year 1863–64.

Regiment.	Station.	On School Books.			Average Number present Daily.	Average Instruction Weekly for Privates.	Number of Months taken.	Remarks.
		Non-com^{d}. Officers.	Privates and Trumpeters.	Total.				
1st Life Guards	Windsor and London.	2	31	33	23	3·13	12	
2nd „ -	London - -	4	40	44	27	2·72	12	
R. H. Guards -	London and Windsor.	6	30	36	22	2·47	11	
1st Drag. Gds.	Bangalore -	23	70	93	28	2·67	12	
2nd „ -	Benares - -	17	123	140	75	·25	12	
3rd „ -	Ahmednuggur -	44	56	100	41	3·59	12	
4th „ -	Dublin and Dundalk.	13	17	30	16	3·89	10	
5th „ -	Dublin and Cahir	31	19	50	13	1·90	12	
6th „ -	Aldershot -	70	180	250	117	13·05	12	
7th „ -	Umballa - -	11	58	69	28	3·06	12	
1st Dragoons -	Birmingham and Aldershot.	16	57	73	44	3·49	12	
2nd „ -	Edinburgh and Birmingham.	8	23	31	19	2·75.	12	2 Det^{ts}.

Regiment.	Station.	On School Books.			Average Number present Daily.	Average Instruction Weekly for Privates.	Number of Months taken.	Remarks.
		Non-com^{d}. Officers.	Privates and Trumpeters.	Total.				
3rd Hussars -	Dublin and Edinburgh.	21	64	85	37	3·34	12	2 Det^{ts}.
4th „ and R. H. A.	Newbridge and Dublin.	25	97	122	48	1·21	*12	
5th Lancers -	Norwich - -	6	44	50	12	2·95	6	2 Det^{ts}.
6th Dragoons -	Mhow - -	10	57	67	21	1·72	12	
7th Hussars -	Peshawur -	1	72	73	25	3·17	10	
8th „ -	Meerutt - -	25	32	57	38	3·48	10	
9th Lancers -	Brighton - -	1	73	74	24	2·32	12	
10th Hussars -	York and Dublin	6	115	121	65	1·48	12	1 Det^{t}.
11th „ -	Cahir and Dublin	1	30	31	21	3·80	12	1 Det^{t}.
12th Lancers -	Aldershot and Hounslow.	48	49	97	69	1·84	12	
13th Hussars -	Aldershot -	29	59	88	42	2·46	11	
14th „ -	Manchester -	7	77	84	36	2·06	12	
15th „ and R. H. A.	Dundalk and Newbridge.	16	53	69	29	2·69	12	1 Det^{t}.
16th Lancers -	Sheffield and York	30	36	66	23	1·53	12	
17th „ -	Secunderabad -	63	41	104	30	2·54	12	1 Det^{t}.
18th Hussars -	Hounslow and Norwich.	21	9	30	16	3·02	11	
19th „ -	Lucknow and Meerutt.	19	48	67	31	4·93	11	
20th „ -	Sealkote - -	17	48	65	41	4·82	11	
21st „ -	Muttra and Umballa.	54	59	113	17	4·06	8	
1st B. Mil. Train 2nd „ - 3rd „ - 4th „ - 5th „ - 6th „ -	- - -	122	267	389	92	12·92		
	Total -	767	2,034	2,801	1,170	2·95		
1st B. Grenadier Guards	Montreal -	45	285	330	104	2·35	12	
2nd „ -	London - -	37	284	321	89	4·45	12	1 Det^{t}.
3rd „ -	London and Windsor.	60	148	208	86	2·18	12	1 Det^{t}.
1st Batt. Coldstream Gds.	Windsor and London.	38	110	148	53	3·01	12	1 Det^{t}.
2nd „ -	London - -	66	203	269	103	2·82	12	1 Det^{t}.
1st B. Scots Fusilier Grds.	London - -	19	150	169	71	2·68	11	
2nd „ -	Montreal - -	36	319	355	126	2·18	12	
	Total -	301	1,499	1,800	632	2·81		

APP. IX.

Regiment.	Station.	On School Books.			Average Number present Daily.	Average Instruction Weekly for Privates.	Number of Months taken.	Remarks.
		Non-com^{d}. Officers.	Privates and Trumpeters.	Total.				
1st B. 1st Foot	Kamptee, Central India.	31	105	136	53	2·12	10	
2nd " -	Portsmouth and Aldershot.	77	103	180	40	4·31	*12	
1st B. 2nd Foot	Devonport and Aldershot.	54	298	352	70	1·28	*11	
2nd " -	Gibraltar - -	64	402	466	67	1·58	11	
1st B. 3rd Foot	Aldershot -	56	194	250	97	1·85	*11	
2nd " -	Gibraltar - -	48	218	266	63	2·88	12	
1st B. 4th Foot	Poona - -	25	255	280	80	1·85	12	
2nd " -	Corfu - -	30	455	485	71	1·30	12	1 Det^{t}.
1st B. 5th Foot	Aldershot and Shorncliffe.	77	107	184	59	3·33	12	
2nd " -	Mauritius and Natal.	45	72	117	42	1·	12	1 Det^{t}.
1st B. 6th Foot	Gosport and Aldershot.	41	74	115	39	1·29	*9	
2nd " -	Corfu - -	40	359	399	76	2·76	12	1 Det^{t}.
1st B. 7th Foot	Ferozepore -	47	67	114	25	2·76	10	1 Det^{t}.
2nd " -	Gibraltar and Malta.	89	99	188	29	2·34	*12	1 Det^{t}.
1st B. 8th Foot	Sheffield - -	65	169	234	62	1·94	*12	1 Det^{t}.
2nd " -	Gibraltar and Malta.	46	423	469	47	1·23	*12	
1st B. 9th Foot	Cephalonia -	23	248	271	76	2·02	*12	1 Det^{t}.
2nd " -	Corfu - -	27	231	258	59	1·50	*12	1 Det^{t}.
1st B. 10th Foot	Dublin, Curragh, &c.	45	139	184	47	1·65	12	1 Det^{t}.
2nd " -	Cape - -	31	45	76	23	2·01	12	1 Det^{t}.
1st B. 11th Foot	Dublin and Curragh.	48	93	141	43	3·55	*12	
2nd " -	Cape - -	43	140	183	36	1·6	10	1 Det^{t}.
1st B. 12th Foot	New South Wales	13	17	30	7	1·10	*12	1 Det^{t}.
2nd " -	Curragh and Dublin.	67	63	130	23	2·32	*12	
1st B. 13th Foot	Bengal - -	26	147	173	71	5·17	11	1 Det^{t}.
2nd " -	Cape and Mauritius.	74	329	403	142	2·43	11	1 Det^{t}.
1st B. 14th Foot	Jamaica - -	37	70	107	16	2·14	12	1 Det^{t}.
2nd " -	New Zealand -	5	78	83	28	3·7	4	1 Det^{t}.
1st B. 15th Foot	Fredericton, N.B.	22	70	92	30	·23	12	1 Det^{t}.
2nd " -	Malta and Gibraltar.	39	194	233	61	3·89	12	1 Det^{t}.
1st B. 16th Foot	Montreal and Toronto.	42	220	262	76	2·51	*12	1 Det^{t}.
2nd " -	Halifax - -	48	182	230	33	1·6	12	
1st B. 17th Foot	Quebec - -	31	117	148	31	1·32	*11	1 Det^{t}.
2nd " -	Halifax - -	63	123	186	63	1·40	12	
1st B. 18th Foot	Secunderabad -	58	131	189	71	3·44	12	
2nd " -	Jersey, Isle of Wight, and New Zealand.	20	36	56	12	1·11	2	1 Det^{t}.
1st B. 19th Foot	Bengal - -	10	29	39	10	5·	12	1 Det^{t}.

Regiment.	Station.	On School Books.			Average Number present Daily.	Average Instruction Weekly for Privates.	Number of Months taken.	Remarks.
		Non-comm. Officers.	Privates and Trumpeters.	Total.				
2nd B. 19th Foot	Newry, Enniskillen, Dublin, and Burmah.	8	94	102	16	1·73	10	1 Det^{t}.
1st B. 20th Foot	Benares - -	20	153	173	74	3·21	11	1 Det^{t}.
2nd „ -	Portsmouth and Bengal.	97	433	530	214	1·61	7	1 Det^{t}.
1st B. 21st Foot	Barbadoes -	78	31	109	55	4·25	12	1 Det^{t}.
2nd „ -	Dublin, Curragh, and Madras.	15	205	220	52	3·56	*7	
1st B. 22nd Foot	Malta - -	24	138	162	28	1·38	12	
2nd „ -	Malta - -	37	236	273	36	2·50	12	
1st B. 23rd Foot	Agra - -	43	419	462	215	·5	12	
2nd „ -	Malta and Gibraltar.	36	421	457	118	1·41	12	1 Det^{t}.
1st B. 24th Foot	Aldershot -	42	115	157	54	5·37	*12	
2nd „ -	Mauritius -	28	32	60	26	2·49	12	1 Det^{t}.
1st B. 25th Foot	Malta - -	63	70	133	52	2·09	12	1 Det^{t}.
2nd „ -	Edinburgh and Ceylon.	1	106	107	23	1·18	9	1 Det^{t}.
26th Foot -	Aldershot, Gosport, and Portsmouth.	69	234	303	73	2·06	*12	1 Det^{t}.
27th „ -	Bengal - -	41	192	233	99	5·0	9	
28th „ -	Nusseerabad -	6	95	101	33	3·50	10	1 Det^{t}.
29th „ -	Glasgow, Dublin, and Curragh.	65	68	133	44	3·34	12	1 Det^{t}.
30th „ -	Toronto and Montreal.	27	91	118	29	1·92	12	
31st „ -	China. No school.							
32nd „ -	Devonport and Dublin.	27	94	121	55	2·46	*12	
33rd „ -	Poona - -	21	26	47	38	2·79	12	
34th „ -	Seetapore - -	34	399	433	195	3·39	12	1 Det^{t}.
35th „ -	Fyzabad - -	2	108	110	60	5·	12	
36th „ -	Dublin - -	40	309	349	180	5·2	*7	
37th „ -	Aldershot -	84	155	239	68	1·66	*11	
38th „ -	Dinapore - -	90	384	474	369	7·80	11	1 Det^{t}.
39th „ -	Bermuda - -	14	94	108	17	1·83	10	1 Det^{t}.
40th „ -	Auckland -	15	18	33	10	3·46	5	
41st „ -	Newcastle - on - Tyne and Glasgow.	23	131	154	67	3·35	11	1 Det^{t}.
42nd „ -	Dugshai - -	27	127	154	50	2·30	11	1 Det^{t}.
43rd „ -	Fort William, Calcutta.	14	121	135	115	6·95	9	1 Det^{t}. R.A.
44th „ -	Belgaum - -	52	186	238	64	4·57	12	
45th „ -	Dublin and Curragh Camp.	48	160	208	53	1·94	*12	
46th „ -	Cawnpore -	38	105	143	43	3·88	9	
47th „ -	Montreal and Kingston, C.W.	74	230	304	114	3·27	12	1 Det^{t}.
48th „ -	Lucknow - -	24	180	204	71	5·00	12	
49th „ -	Manchester -	67	68	135	55	3·22	11	1 Det^{t}.

APP. IX.

Regiment.	Station.	On School Books.			Average Number present Daily.	Average Instruction Weekly for Privates.	Number of Months taken.	Remarks.
		Non-comm. Officers.	Privates and Trumpeters.	Total.				
50th Foot -	Ceylon - -	13	126	139	75	7·84	9	1 Det.
51st „ -	Rawul Pindee -	72	147	219	87	3·77	10	1 Det.
52nd „ -	Hazareebagh -	5	42	47	21	4·61	10	1 Det.
53rd „ -	Portsmouth -	49	165	214	38	0·90	11	
54th „ -	Roorkee and Benares.	30	75	105	37	5·72	11	1 Det.
55th „ -	Portsmouth -	47	166	213	66	2·80	9	
56th „ -	Deesa - -	34	114	148	40	5·27	11	
57th „ -	New Zealand -	8	66	74	9	1·10	3	1 Det.
58th „ -	Dublin and Newry	61	135	196	51	2·09	*12	1 Det.
59th „ -	Dover and Aldershot.	60	213	273	77	1·73	12	
1st B. 60th Foot	Tower, London	57	101	158	47	1·83	12	1 Det.
2nd „ -	Portsmouth and Aldershot.	87	188	275	87	1·81	11	
3rd „ -	Burmah - -	25	59	84	29	4·77	12	1 Det.
4th „ -	Quebec and Montreal.	41	145	186	37	1·66	*9	
61st Foot -	Aldershot and Jersey.	19	48	67	22	1·78	*12	1 Det.
62nd „ -	Kingston and Quebec.	46	264	310	75	2·50	12	1 Det.
63rd „ -	London, C.W. -	16	63	79	30	1·43	12	
64th „ -	Aldershot and Gosport.	83	248	331	59	1·96	11	1 Det.
65th „ -	New Zealand -	—	1	1	1	·20	5	
66th „ -	Bangalore -	29	152	181	65	2·68	12	
67th „ -	Shanghai - -	7	66	73	32	4·	7	
68th „ -	Rangoon - -	18	340	358	48	3·48	9	
69th „ -	Madras - -	18	207	225	42	1·88	12	
70th „ -	New Zealand -	2	7	9	5	3·44	5	
71st „ -	Nowshera -	23	92	115	54	3·48	12	1 Det.
72nd „ -	Mhow, E. Indies	53	125	178	89	4·61	12	1 Det.
73rd „ -	Plymouth and Aldershot.	44	148	192	69	2·79	12	1 Det.
74th „ -	Bellary, E. Indies	15	165	180	106	2·73	12	
75th „ -	Devonport and Aldershot.	12	138	150	52	2·59	12	
76th „ -	Aldershot -	66	138	204	66	2·39	*9	
77th „ -	Allahabad -	39	117	156	53	5·23	12	1 Det.
78th „ -	Shorncliffe and Dover.	57	372	429	97	1·69	*12	
79th „ -	Peshawur -	3	52	55	17	3·772	11	
80th „ -	Bengal - -	29	90	119	51	5·11	12	1 Det.
81st „ -	Morar Gwalior -	24	432	456	184	5·8	12	
82nd „ -	Bengal - -	27	73	100	38	6·5	*12	
83rd „ -	Dover and Shorncliffe.	9	168	177	30	2·21	*9	
84th „ -	Shorncliffe and Curragh.	25	383	408	61	·78	12	
85th „ -	Cape and Dover	5	88	93	23	2·76	8	1 Det.
86th „ -	Waterford and Dublin.	44	126	170	59	3·85	12	1 Det.

Regiment.	Station.	On School Books.			Average Number present Daily.	Average Instruction Weekly for Privates.	Number of Months taken.	Remarks.
		Non-comd. Officers.	Privates and Trumpeters.	Total.				
87th Foot -	Curragh and Aldershot.	27	219	246	86	5·65	*12	
88th „ -	Bengal - -	26	127	153	134	3·58	12	
89th „ -	Bengal - -	40	82	122	31	4·9	12	
90th „ -	Bengal - -	62	51	113	55	4·15	11	
91st „ -	Jubbalpore -	3	106	109	40	3·07	8	1 Det^{t}.
92nd „ -	Edinburgh -	45	77	122	59	3·62	6	
93rd „ -	Sealkote - -	3	85	88	45	4·77	10	
94th „ -	Jullundur and Mean Meer.	32	163	195	73	3·16	11	
95th „ -	Hydrabad -	16	69	85	45	3·42	11	1 Det^{t}.
96th „ -	Shorncliffe and Cape.	27	125	152	54	2·37	11	1 Det^{t}.
97th „ -	Saugor - -	39	444	483	207	3·35	11	1 Det^{t}.
98th „ -	Umballa - -	2	92	94	41	3·89	10	
99th „ -	Hong Kong -	61	80	141	46	2·24	11	1 Det^{t}.
100th „ -	Gibraltar and Malta.	15	238	253	18	·41	12	
101st „ -	Rawul Pindee -	9	69	78	16	4·98	7	1 Det^{t}.
102nd „ -	Cannanore -	15	60	75	26	4·81	12	1 Det^{t}.
103rd „ -	Bombay - -	20	152	172	70	4·40	10	1 Det^{t}.
104th „ -	Bareilly - -	4	47	51	21	5·62	12	
105th „ -	Wellington, Madras.	18	87	105	10	2·94	*8	1 Det^{t}.
106th „ -	Neemuch, Bombay.	29	50	79	29	4·24	11	
107th „ -	Lucknow - -	40	85	125	50	3·42	10	
108th „ -	Secunderabad -	11	39	50	8	2·49	10	
109th „ -	Kurrachee -	42	134	176	55	2·90	12	
1st B. Rifle Brig.	Hamilton, C.W.	44	122	166	52	3·00	*12	1 Det^{t}.
2nd „ -	Delhi - -	20	110	130	26	2·07	7	
3rd „ -	Mean Meer -	48	139	187	77	6·15	6	
4th „ -	Malta and Gibraltar.	55	176	231	55	1·87	11	
	Total -	5,056	21,202	26,258	8,150	3·00		
1st West India Regiment.	Barbados and Nassau, Bahamas.	6	106	112	51	4·83	9	
2nd „ -	Nassau - -	29	128	157	85	3·72	6	
3rd „ -	Sierra Leone -	7	157	164	70	3·41	6	
4th „ -	Cape Coast Castle	27	130	157	56	3·55	6	
5th „ -								
Ceylon Rifles -	Cape - -	4	76	80	25	3·57	10	1 Det^{t}.
Cape Md. Rifles	Cape - -	13	39	52	21	3·67	11	
St. Helena Regt.	St. Helena -	29	168	197	110	2·10	11	1 Det^{t}.
Canadian Rifles	London, C.W., & Newfoundland.	8	35	43	22	5·28	12	
Malta Fencibles	Malta - -	18	59	77	5	1·70	12	
	Total -	141	898	1,039	445	3·54		

App. IX.

Regiment.	Station.	On School Books.			Average Number present Daily.	Average Instruction Weekly for Privates.	Number of Months Taken.	Remarks.
		Non-comt. Officers.	Privates and Trumpeters.	Total.				
1st Depôt Batt.	Chatham - -	15	92	107	41	1·59	*12	
2nd „ -	Chatham - -	5	106	111	46	1·96	*12	
3rd „ -	Chatham - -	23	126	149	48	2·71	*12	1 Dett.
4th „ -	Colchester -	37	157	194	65	1·47	9	
5th „ -	Parkhurst -	16	74	90	37	2·99	*12	
6th „ -	Walmer - -	21	178	199	57	3·	*12	
7th „ -	Winchester -	65	91	156	47	2·44	11	
8th „ -	Pembroke -	56	113	169	73	2·77	*12	
9th „ -	Colchester -	64	100	164	52	1·54	12	
10th „ -	Colchester -	48	85	133	64	1·81	12	
11th „ -	Preston - -	95	106	201	77	2·84	12	
12th „ -	Athlone - -	12	149	161	54	3·32	*12	
13th „ -	Birr - -	65	138	203	83	2·76	*12	
14th „ -	Belfast - -	48	197	245	88	2·53	*12	
15th „ -	Buttevant -	71	118	189	88	2·	*10	
16th „ -	Templemore -	26	183	209	57	1·33	*12	
17th „ -	Limerick - -	69	449	518	336	3·12	*11	1 Dett.
18th „ -	Fermoy - -	40	179	219	75	2·39	*12	1 Dett.
19th „ -	Fermoy - -	16	205	221	90	2·90	*11	
20th „ -	Cork - -	13	145	158	45	1·32	12	
22nd „ -	Stirling - -	34	210	244	95	1·65	12	
23rd „ -	Aberdeen -	24	203	227	103	4·48	*12	1 Dett.
Cavalry Depôt	Canterbury -	14	57	71	31	2·21	9	
„ -	Maidstone -	2	11	13	8	4·19	11	
Guards Depôt -	St. John's Wood	13	157	170	143	8·43	12	
	Total -	892	3,629	4,521	1,903	3·11		
Royal Artillery.								
1st Horse Brig.	Woolwich -	72	214	286	100	1·63	*12	
Depôt - -	Canterbury -	12	90	102	41	1·48	9	
1st Brig. Head Quarters.	Gibraltar - -	47	58	105	18	2·38	*12	1 Dett.
2nd „ -	Dover - -	40	155	195	43	1·20	*12	1 Dett.
3rd „ -	Malta - -	15	76	91	19	1·45	*12	1 Dett.
4th „ -	Aldershot -	45	42	87	23	2·50	12	
5th „ -	Plymouth -	34	90	124	25	2·07	12	1 Dett.
6th „ -	Portsmouth -	44	48	92	34	2·72	11	1 Dett.
7th „ -	Woolwich and Gosport.	19	81	100	36	2·70	*12	1 Dett.
8th „ -	Dublin - -	21	24	45	20	2·73	*9	
9th „ -	Shorncliffe -	115	191	306	109	4·10	12	
10th „ -	Montreal - -	62	174	236	87	2·84	12	1 Dett.
11th „ -	India.							
12th „ -	Mauritius - -	6	21	27	15	7·08	12	
13th „ -	Woolwich -	82	60	142	39	2·60	12	
14th „ -	Ahmedabad -	22	11	33	17	3·8	4	1 Dett.
15th „ -	Halifax, N.S. -	34	75	109	52	3·96	12	

Regiment.	Station.	On School Books.			Average Number present Daily.	Average Instruction Weekly for Privates.	Number of Months taken.	Remarks.
		Non-comd. Officers.	Privates and Trumpeters.	Total.				
16th Brig. H.Q.	India.							
17th „ -								
18th „ -								
19th „ -								
20th „ -								
21st „ -								
22nd „ -								
23rd „ -								
24th „ -								
25th „ -								
Depôt Brigades	Sheerness -	56	173	229	90	2·85	*12	
„ „ -	Woolwich -	124	240	364	127	2·77	*12	
„ „ -	Warley - -	35	126	161	96	3·82	*12	
Det. 6th Brig. -	Alderney - -	11	92	103	18	2·18	11	
„ Coast Brig.	Alderney - -	4	3	7	7	1·3	1	
„ 8th Brig. -	Ballincollig -	43	36	79	38	2·02	*11	
„ 15th „ -	Bermuda - -	11	21	32	13	6·10	5	
„ 3rd „ -	Corfu - -	12	186	198	56	3·76	12	
„ Horse „ -	Dublin - -	19	33	52	16	1·64	*11	
„ 8th „ -	Devonport -	20	16	36	16	4·	11	
„ 6th „ -	Guernsey - -	14	63	77	12	1·56	12	
„ 4th „ -	Hilsea - -	39	18	57	22	1·90	12	
„ 12th „ -	Hong Kong -	9	66	75	5	·87	10	
„ 15th „ -	Jamaica - -	18	23	41	11	7·53	12	
„ 10th „ -	Kingston, C.W.	28	39	67	25	3·	*12	
„ 9th „ -	Leith Fort -	17	31	48	14	3·	12	
„ 8th „ -	Limerick - -	22	22	44	18	2·46	6	
„ 4th „ -	London, C.W. -	18	16	34	17	4·18	11	
„ 10th „ -	Newfoundland -	15	62	77	17	2·25	8	
„ Coast „ -	Purfleet - -	2	1	3	2	7·13	6	
„ 10th „ -	Quebec - -	31	107	138	46	2·70	*12	
„ „ „ -	Shoeburyness -	3	21	24	13	2·77	9	
„ 12th „ -	St. Helena -	5	41	46	15	3·14	11	
„ 10th „ -	Toronto, C.W. -	10	24	34	20	2·75	12	
„ „ „ -	Woolwich (Special Class of N.C. Officers.)	10	1	11	10	32·5		
	Total -	1,246	2,871	4,117	1,402	3·86		
Royal Engineers	Aldershot -	31	177	208	76	2·47	12	
„ „	Chatham - -	52	550	602	326	3·46	12	
„ „	Corfu - -	14	150	164	23	5·66	12	
„ „	Curragh - -	10	70	80	66	3·70	1	
„ „	Gibraltar - -	24	23	47	15	2·53	11	
„ „	London, C.W. -	12	98	110	19	14·	6	
„ „	Malta - -	16	43	59	12	5·49	12	
„ „	Woolwich -	6	51	57	31	1·33	12	
	Total -	165	1,162	1,327	568	4·83		

App. X. Nos. 1, 2.

Appendix X.—No. 1.

Office of the Council of Military Education,
13, Great George Street (S.W.),
May 2, 1862.

Sir,

The Council of Military Education having had under consideration the plan that has been followed in some corps, of forming a special class of non-commissioned officers and men for regular attendance at school, I am directed to request you in your interviews with commanding officers to suggest that course for their adoption.

The mode of carrying out such an arrangement must of course depend on a variety of regimental and local circumstances, and the decision, whether to adopt it or not, must rest entirely with the commanding officer.

Should, however, a class of this description have not yet come under your observation, I am to state that the plan generally followed is to select three, four, or five men per company for their intelligence, good character, and proficiency in their drill, who shall voluntarily engage to attend school daily for not less than three hours, and to allow such men to take on Saturdays their guards or other necessary duties. The afternoon school can in nearly all cases be made available for this purpose. In some instances the class thus formed is a mixed one of non-commissioned officers and men, in others it consists solely of privates. Care must be taken that this arrangement be not allowed to interfere with the instruction of the general classes of adults.

It will of course be understood that the council have no desire in making the above suggestion to interfere in the slightest degree with the arrangements for duty of the command in which any corps may be placed.

I have, &c.

To the Assistant and Local Inspectors of Army Schools.

(Signed) D. Greentree,
Captain and Secretary.

Appendix X.—No. 2.

Commandant's Office,
Woolwich, June 29, 1864.

Sir,

I have the honour to transmit the enclosed report from Quartermaster Wharry, R.A., in accordance with the request contained in your letter, dated 24th instant.

I have, &c.

The President of the Council of Military Education.

(Signed) E. Warde,
Major-General Commanding.

Woolwich, June 28, 1864.

Sir

With reference to your minute on the letter from the Council of Military Education, dated 24th instant, directing me to furnish for the information of the Council a memo. of the special class of non-commissioned officers, showing the following particulars, viz. :—

1. The date of the organization of the class.
2. The number of men who have been taught in it.
3. The present position of these men.

I have the honour to report as follows, viz. :—

1. In October 1848 ten non-commissioned officers, being one from each battalion of Royal Artillery, were selected by order of the Adjutant-

General of Artillery for a course of instruction under the serjeant schoolmaster, with the view to their becoming qualified for the duties of acting schoolmasters at detached commands.

The course of instruction lasted for 12 months, and the men did no other duty during that time. On the completion of the course they were eligible for the appointments of acting schoolmasters, and many of them were so employed, but their acceptance of this employment was, in most cases, optional.

2. This class has been continued, with but little interruption, from October 1848 down to the present date. About 200 non-commissioned officers have been taught in it.

3. The present position of these men is this,—

Having completed the course of instruction they are ordered to rejoin their batteries for ordinary duty. Their subsequent employment in any special capacity is discretional with their commanding officers.

It has always been considered impossible to set apart men who are on the effective strength of batteries for permanent school teachers, and although the instruction given to non-commissioned officers in this class is of great value in rendering them fit for other appointments in the service, the original intention of employing young non-commissioned officers who have been trained in this class as acting schoolmasters or school assistants, has never been fully carried out. Many of them have become clerks and pay-sergeants. Some have been promoted to laboratory and staff-serjeants. Others have in the course of time left the service on pension. Seven of them have become army schoolmasters. A few have received commissions, but not very many of the 200 who have been taught in this class are now employed on school duties.

I beg, with the greatest respect, to refer the Council for further information relative to special classes to a memo. on artillery schools furnished by me to Major-General Lefroy in April 1857, and published at p. 164 of his report to the Secretary of State for War on Army Schools and Libraries.

I have, &c.

The Brigade Major, &c. &c.

(Signed) C. Wharry, Quartermaster, R.A.

Appendix X.—No. 3.

B.

Examination Paper.

1. Write on this line your name - - -	Thomas White.
2. The name of the place where you were born -	Battle, Sussex.
3. The county in which you were born - -	Sussex.
4. The time you have been in the army - -	Eight years.
5. The name of your regiment - - -	Royal Artillery.
6. Your rank in the army - - -	Sergeant.
7. The date of this day - - - -	3rd December 1863.
8. The name of this school - - -	R.A. Regimental School.

Write down some words which will be read to you (50 words).

The cause of a rocket's motion is the excess of the pressure exerted upon the body in one direction over that by which it is acted upon by the opposite, *i.e.*, a rocket moves in the direction of its head as soon as

App. X. No. 3.

its inertia is overcome, because the pressure is greater in that direction than in the opposite, where it finds an escape through the vents. This pressure is caused by an elastic gas intensely heated.

SCHOOLMASTER'S REPORT, certified by the Inspector.

Number of Mistakes in Spelling.	Sums worked correctly specified by their Numbers.		Can read at the most		
	Form B.	Form C.	Letters and Monosyllables.	Easy Narratives.	Books of General Information.
Nil.	—	—	—	—	Yes.

N.B.—A mark is to be put in that Column whose heading represents the Soldier's proficiency in Reading.

C.

Write here your name - - - Thomas White.
Write the name of your regiment - Royal Artillery.

HISTORY of ENGLAND and GEOGRAPHY.

1. What kings reigned in the 17th century?

Elizabeth, crowned 1558, died 1603, reigned 45 years.
James I., crowned 1603, died 1625, reigned 22 years.
Charles I., crowned 1625, died 1649, reigned 24 years.
Commonwealth, from 1649 to 1660.
Charles II., crowned 1660, died 1685, reigned 25 years.
James II., crowned 1685, abdicated 1688, reigned three years.
William and Mary, crowned 1688, William III. died 1702, reigned 14 years.

2. Name the chief events in the reign of William and Mary?

James II. landed at Kinsale in Ireland with 5,000 French troops. Massacre of Glencoe. Battle of the Boyne. The English fleet worsted off Beachy Head. The English gained a naval battle off La Hogue. A plot formed by the supporters of James to assassinate William. Treaty of Ryswick. The Bank of England established. Peter the Great, Czar of Russia, came to England and worked as a ship carpenter.

3. Give some account of the Battle of the Boyne?

James after abdicating the throne went to France, but soon after returned to Ireland with a French army, and was joined by Talbot, Duke of Tyrconnel, who commanded the Irish army. They laid siege to Londonderry and then fell back as far as the River Boyne. William sent the Duke of Schomberg with an army to oppose them, and afterwards went himself, and landing at Carrickfergus, he totally defeated James at the Battle of the Boyne. James again fled to France and never again attempted to claim the Crown.

4. Name the chief countries in the continent of America?

North America.—British America in the north, United States in the centre, and Mexico and Guatemala in the south.

South America.—New Granada, Venezuela, Equador, and Guiana in the north. Brazil in the east. The United Provinces of La Plata,

Paraguay, and Uruguay in the south-east; and Patagonia in the south; and Chili, Bolivia, and Peru in the west.

5. Name the chief mountain ranges, rivers, cities, and sea-ports in the United States?

The Rocky Mountains and the Alleghanies. Rivers:—Connecticut, Hudson, Delaware, Potomac, James, Savanah, Ohio, Tennessee, Mississippi, Missouri, Arkansas, Red River, Columbia. Cities:—New York, Philadelphia, Baltimore, New Orleans, Boston, Cincinnati, Brooklyn, Albany, Charleston, Washington, Providence, Louisville, Pitsburg, Lowell, Rochester, Richmond, Troy, Buffalo, Newark, St. Louis, Portland, Salem. Seaports:—New York, Philadelphia, Baltimore, New Orleans, Boston, Charleston, Portland, and Brooklyn.

6. What are the chief exports and imports of the United States.

The exports consist chiefly of raw materials. The five most considerable articles are cotton,* flour, tobacco, timber, and rice. Imports,—Colonial produce and manufactured goods.

Arithmetic.

If a beam which is 10 in. wide, 8 in. deep and 5 ft. 6 in. long, weigh 8 cwt. 1 qr., find the length of another beam, the end of which is a square foot, which shall weigh a ton.

Here, as $(12 \times 12$ in.$) : (8 \times 10$ in.$) :: 66$ in.
33 qrs. $: 80$ qrs.

Therefore $\frac{80}{144} \times \frac{80}{33} \times 66 = \frac{800}{9} = 88\frac{8}{9}$ in. $= 7$ ft. $4\frac{8}{9}$. Answer.

The weights of equal quantities of lead and cork are as 11·324 and ·24, and 60 cubic inches of lead with 54 of cork weigh as much as $1{,}538\frac{2}{3}$ of fir, what number represents proportionally the weight of fir.

Here, $\left.\begin{matrix} 11{\cdot}324 \times 60 = 679{\cdot}44 \\ {\cdot}24 \times 54 = 12{\cdot}96 \end{matrix}\right\} = 692{\cdot}4.$

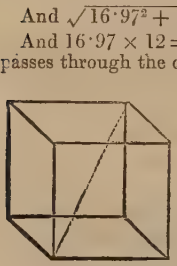
Therefore $\frac{692{\cdot}4}{1538\frac{2}{3}} = {\cdot}45$ the No.

How many inches are there in the diagonal of a cubic foot; and how many square inches in a superficies made by a plane through the opposite edges.

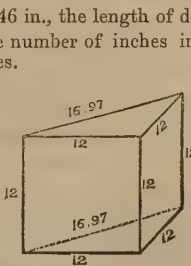
Here $\sqrt{12^2 + 12^2} = 16{\cdot}97$ diagonal of 1 side of cube.

And $\sqrt{16{\cdot}97^2 + 12^2} = 20{\cdot}7846$ in., the length of diagonal.

And $16{\cdot}97 \times 12 = 203{\cdot}64$ the number of inches in the plane which passes through the opposite edges.



whole cube.



cube cut in two.

* Cotton is not exported now, owing to the blockade of the Southern ports.

App. X. No. 3.

A body of 7,300 troops is formed of 4 battalions so that $\frac{1}{2}$ of the 1st, $\frac{2}{3}$ of the second, $\frac{3}{4}$ of the third, and $\frac{4}{5}$ of the fourth, are all composed of the same number of men, how many were there in each?

Here if 12 be the number.
If the $\frac{1}{2} = 12$, the whole number $= 24$.
" $\frac{2}{3} = 12$ " $= 18$.
" $\frac{3}{4} = 12$ " $= 16$.
" $\frac{4}{5} = 12$ " $= 15$.
Then $24 + 18 + 16 + 15 = 73$.

Therefore $\frac{24}{73} \times 7{,}300 = 2{,}400$, No. in 1st battalion.

" $\frac{18}{73} \times 7{,}300 = 1{,}800$, No in 2nd battalion.

" $\frac{16}{73} \times 7{,}300 = 1{,}600$, No. in 3rd battalion.

" $\frac{15}{73} \times 7{,}300 = 1{,}500$, No. in 4th battalion.

The length of a pendulum which vibrates seconds is, in these countries, 39·1386 in., and the length varies as the squares of the number of seconds in a vibration, what must be the length of the pendulum vibrating once in 3 seconds?

Here as $1^2 : 3^2 :: 39{\cdot}1386 = 29$ ft. 4·2474 in.

Five thousand copies are issued of a 6*s.* book, the cost of printing is 1*s.* per copy, of binding 4*d.*, and of carriage, advertising, &c., 2*d.*, the publisher disposes of them to the retail bookseller, charging 25 copies as 24, and 30 per cent. less than the selling price, and upon the whole receipt takes 10 per cent. commission for himself, what are the gains of the author, publisher, and bookseller on this edition.

Here $\frac{5000 \times 6}{20} = 1500l.$ the amount realized on this edition.

$\frac{1{\cdot}5 \times 5000}{20} = 375l.$ cost of printing, &c.

$\frac{3}{10} \times 1500 = 450l.$, the rate of 30 per cent.

$1500 - 450 = 1050l.$, after the 30 per cent. is deducted.

Then $\frac{24}{25} \times 1050 = 1008l.$, the amount paid by bookseller.

Therefore $1500 - 1008 = 492l.$, the bookseller's gain.

And $\frac{1}{10} \times 1008 = 100l.\ 16s.$, publisher's gain.

And $1008 - (100l.\ 16s. + 375l.) = 532l.\ 4s.$ author's gain.

A person has 1,000*l.* in the $3\frac{1}{2}$ per cents.; how much must he have also in the 3 per cents. that his whole income may be 200*l.*, and what sum would he realize by selling out @ $83\frac{1}{3}$ and $77\frac{1}{3}$ respectively?

Here as $100l. : 3\frac{1}{2}l. :: 1000l. = 35l.$ gain on $1000l.$ at $3\frac{1}{2}$ per cent.
Then $200l. - 35l. = 165l.$, the sum he must gain at 3 per cent.
Hence as $3l. : 100l :: 165l. : 5500l.$ the amount in the 3 per cents.

Again as 100*l.* : $83\frac{3}{5}$*l.* :: 1000*l.* : 836*l.* 5*s.*, his gain in selling out of the $3\frac{1}{2}$ per cents.

And as 100*l.* : $77\frac{1}{8}$ :: 5500*l.* : 4241*l.* 17*s.* 6*d.*, his gain in selling out of the 3 per cents.

A fountain has 4 cocks A,B,C, and D, and under it a cistern stands, which can be filled by A in 6, by B in 8, by C in 10, and by D in 12 hours; the cistern has also 4 cocks, E,F,G, and H, and can be emptied by E in 6, by F in 5, by G in 4, and by H in 3 hours, suppose the cistern is full of water, and that the 8 cocks are all open, in what time will it be emptied?

Here $\frac{1}{6}+\frac{1}{8}+\frac{1}{10}+\frac{1}{12}=\frac{19}{40}$ of the cistern can be filled in one hour, and $\frac{1}{6}+\frac{1}{5}+\frac{1}{4}+\frac{1}{3}=\frac{19}{20}$ of the cistern can be emptied in one hour.

Hence $\frac{19}{20}-\frac{19}{40}=\frac{19}{40}$ of the cistern is emptied in one hour.

Therefore, as $\frac{19}{40}$: 1 :: 1^{h} : $\frac{40^{h}}{19}$, the time the cistern will be emptied $=2\frac{2}{19}$ hours.

A vintner has a vessel of wine containing 500 gal.; drawing 50 gal., he then fills up the cask with water, after doing this 5 times, how much wine, and how much water are in the cask?

Here since the wine diminishes $\frac{1}{10}$ in succession,

We have $500\times\frac{1}{10}=50$ $\therefore$ $500-50=450$ gal. after 1st drawing.

And $450\times\frac{1}{10}=45$ $\therefore$ $450-45=405$ gal. after 2nd drawing.

„ $405\times\frac{1}{10}=\frac{81}{2}$ $\therefore$ $405-\frac{81}{2}=\frac{729}{2}$ gal. after 3rd drawing.

„ $\frac{729}{2}\times\frac{1}{10}=\frac{729}{20}$ $\therefore$ $\frac{729}{2}-\frac{729}{20}=\frac{6561}{20}$ gal. after 4th drawing.

„ $\frac{6561}{20}\times\frac{1}{10}=\frac{6561}{200}$ $\therefore$ $\frac{6561}{20}-\frac{6561}{200}=\frac{59049}{200}$ gal. after 5th drawing.

Therefore $\frac{59049}{200}$ gal. $=295\frac{49}{200}$ gal. of wine remaining in cask.

And $500-295\frac{49}{200}=204\frac{151}{200}$ gal. of water in cask.

Algebra.

Two girls carried between them 25 eggs to market, they sold at different prices but each received the same amount upon the whole, the first would have sold them all for 1 shilling the second for 13 pence, how many did they each sell?

Let x = No. of eggs sold by first girl.

$\therefore$ $25-x=$ „ second girl.

And $12x=$ the amount received by first girl.

$(25-x)\,13=$ „ second girl.

And since the amounts received by each girl were equal,

We have $12x=(25-x)\,13$ by question.

Clearing brackets, $12x=325-13x$.

Collecting $25x=325$.

$$\therefore \quad x=\frac{325}{25}=13 \text{ No. sold by first girl,}$$

And 25—13=12, No. sold by second girl.

A trader maintains himself for 3 years at an expense of 50*l.* a year, and in each of these years increased the part of his stock which was not so expended by $\frac{1}{3}$ thereof: at the end of 3 years his original stock was doubled: find it?

App. X. No. 3.

Let x = the original stock in £

Then $(x - 50)$ = stock after 1st year's expenses are deducted.

And $1\frac{1}{3}(x - 50)$ = stock after 1st year.

„ $1\frac{1}{3}\{1\frac{1}{3}(x - 50) - 50\}$ = stock after 2nd year.

„ $1\frac{1}{3}[1\frac{1}{3}\{1\frac{1}{3}(x - 50) - 50\} - 50]$ = stock after 3rd year.

Then $1\frac{1}{3}[1\frac{1}{3}\{1\frac{1}{3}(x - 50) - 50\} - 50] = 2x$ by question.

Clearing brackets $\frac{64}{27}x - \frac{3200}{27} - \frac{800}{9} - \frac{200}{3} = 2x.$

Multiplying by 27 $64x - 3200 - 2400 - 1800 = 54x.$

Collecting and transposing $10x = 7400.$

$$\therefore \quad x = \frac{7400}{10} = 740l. \quad \text{Answer.}$$

Find a number of 2 digits such that the quotient by their sum exceeds the first digit by one and equals the other.

Let x = the 1st digit.

And y = the 2nd digit.

Then $10x + y$ = the number.

And $x + y$ = the sum of the digits.

Then (I.) $\frac{10x + y}{x + y} = x + 1$

(II.) $\frac{10x + y}{x + y} = y$ } by question.

Clearing fractions (I.) $10x + y = x^2 + y + x + xy.$

„ (II.) $10x + y = y^2 + xy.$

Collecting and transposing (I.) $9x = x^2 + xy.$

Dividing by x $\quad 9 = x + y.$

$\therefore \quad x = 9 - y.$

And taking the value of $x = 9 - y$ in (II.), we have

$$10(9 - y) + y = y(9 - y) + y^2$$

Clearing brackets, $90 - 10y + y = 9y - y^2 + y^2$

Transposing and collecting $18y = 90.$

$$\therefore \quad y = \frac{90}{18} = 5 = \text{2nd digit.}$$

And $9 - y = x \therefore 9 - 5 = 4 = x =$ 1st digit.

Therefore the No. is 45.

A train left Cambridge for London with a certain number of passengers, 40 more second-class than first-class, and 7 of the former would pay together 2*s.* less than 4 of the latter. The fare of the whole was 55*l.*, but they took up, half-way 35 more second-class and 5 first-class passengers, and the whole fare now received was $\frac{1}{8}$ as much again as before. What was the first-class fare, and the whole number of passengers at first?

Here, (*First.*) Let y = second-class fare in shillings.

And z = first „ „

Then (I.) $7y + 2 = 4z.$

(II.) $\frac{1}{2}(35y + 5z) = \frac{1}{8} \times 55 \times 20$ } by question.

Clearing brackets and transposing { I. $7y - 4z = -2$. II. $\frac{35}{2}y + \frac{5}{2}z = 220$.

Clearing fractions I. $7y - 4z = -2$. II. $35y + 5z = 440$.

Multiplying I. by 5 I. $35y - 20z = -10$. II. $35y + 5z = 440$.

By subtracting $-25z = -450$.

$$\therefore \quad z = \frac{450}{25} = 18s. \text{ first-class fare.}$$

And I. $7y - 4z = -2$.

$$\therefore \quad y = \frac{70}{7} = 10s. \text{ second-class fare.}$$

(*Second.*) Let x = No. of first-class passengers.

Then $(x + 40)$ = „ second-class „

Then $18x + 10(x + 40) = 55 \times 20$.

Clearing brackets $18x + 10x + 400 = 1100$.

Collecting and transposing $28x = 700$.

$$\therefore \quad x = \frac{700}{28} = 25, \text{ No. of first-class passengers.}$$

And $x + (x + 40) = 90$, whole number of passengers.

The diagonal of a cube is a foot longer than each of the edges; find the solid contents?

Let x = the length of one of the edges in feet.

Then $(x + 1)$ = the length of the diagonal in feet.

Then, according to Prop. 47, 1st B. Euclid, we have,

$$x^2 + x^2 + x^2 = (x + 1)^2 \text{ by question.}$$

or, $x^2 + x^2 + x^2 = x^2 + 2x + 1$.

Collecting and transposing $2x^2 - 2x = 1$.

Dividing by 2 $x^2 - x = \cdot 5$.

Adding $(\frac{1}{2}$ coeff. of $x)^2$ $x^2 - x + 5^2 = \cdot 5 + \cdot 5^2$.

Extracting the root $x - \cdot 5 = \cdot 8662$ or $x = 1 \cdot 3662$.

$\therefore 1 \cdot 3662^3 = 2 \cdot 549$ solid contents of cube.

The fore wheel of a carriage makes 6 more revolutions than the hind wheel in 120 yards, and the circumference of one is a yard less than that of the other; find that of each.

Here let x = the circumference of the fore wheel in yards.

$x + 1$ = „ hind wheel „

$\frac{120}{x}$ = No. of revolutions performed by fore wheel in 120 yards.

$\frac{120}{x+1}$ = „ hind wheel „

Then $\frac{120}{x} - 6 = \frac{120}{x+1}$ by question.

Clearing fractions $120x + 120 - 6x^2 - 6x = 120x$.

Collecting $6x^2 + 6x = 120$.

Dividing by 6 $x^2 + x = 20$.

Completing square $x^2 + x + (\frac{1}{2})^2 = 20 + (\frac{1}{2})^2$.

Extracting the root $\therefore x + \frac{1}{2} = \frac{9}{2}$ or $x = 4$ circumference of the fore wheel, and $x + 1 = 5$ the circumference of hind wheel.

App. X. No. 3.

Mensuration.

Find the side of an equilateral triangle equal in area to a trapezoid, of which the parallel sides are $\frac{1}{8}$ and $\frac{2}{9}$ of an inch; and the breadth $\frac{3}{10}$ of an inch.

Here $\frac{1}{2}\left(\frac{1}{8}+\frac{2}{9}\right)\times\frac{3}{10}=\cdot052$ area of trapezoid.

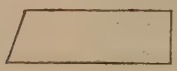
And if the side of an equilateral triangle be taken as 1,

Then $\sqrt{1^2-\cdot5^2}=\cdot866$ altitude of equilateral triangle.

And $\cdot866\times\cdot5=\cdot433$ area of equilateral triangle.

And as $\sqrt{\cdot433}:\sqrt{\cdot052}::1:\cdot346$ in, the side required.

Trapezoid.

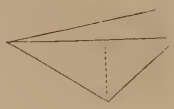


Triangle.

A diagonal of a quadrilateral acre is 63 yards, and the perpendiculars on it from the opposite angles are as 16 to 61, how much is the one perpendicular longer than the other?

Here $\frac{4840\times2}{63}=\frac{9680}{63}$ sum of perpendiculars.

Now the perpendiculars being as 16 to 61, their difference is $\frac{45}{77}$ of their sum.



Therefore $\frac{45}{77}\times\frac{9680}{63}=89\cdot79$ in diff.

The greater base of a regular tapering trapezoid 3 feet long is 8 inches, and the lesser base is 5 inches, what must be cut off from the narrow end to make a square foot?

Here, A B = 8 in., C D = 5 in., H K = 36 in., A H = 4 in., C K = 2·5 in., and A M = 1·5 in.

And as 1·5 : 36 :: 4 : 96 in. = G H;

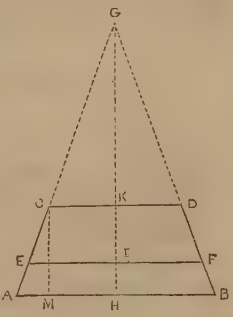
and 96 − 36 = 60 in. = G K;

and $\frac{60\times5}{2}=150$ sq. in. area G C D.

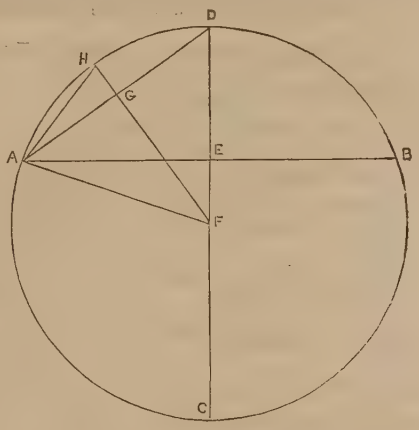
Therefore 150 + 144 = 294 sq. in. area G E F.

And as $\sqrt{150}:\sqrt{294}::60.84$ in G I.

And 84 − 60 = 24 in., or 2 feet, K I or the part cut off.



If the circumference of a circle, whose diameter is 169 be divided into two arcs by a chord measuring 120, what will be the chord of a fourth part of the smaller arc?



Here A B = 120, D C = 169, D F = 84·5, and A E = 60;

Then $\sqrt{84\cdot5^2 - 60^2} = 59\cdot5 = E F$;

And $84\cdot5 - 59\cdot5 = 25 = D E$;

And $\sqrt{60^2 + 25^2} = 65 = A D$;

And $\frac{65}{2} = 32\cdot5 =$ A G or G D.

Then $\sqrt{84\cdot5^2 - 32\cdot5^2} = 78 = G F$;

And $84\cdot5 - 78 = 6\cdot5 = H G$;

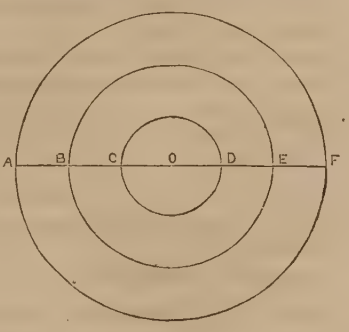
And $\sqrt{32\cdot5^2 + 6\cdot5^2} = 33\cdot1435 = A H$, the chord required.

What is the circumference of a half-crown piece if its diameter is ·32 inch longer than that of a shilling, and if the diameter of a piece 7 inches in circumference would be as long as the diameters of a half-crown and a shilling together.

Here $\cdot32 \times 3\cdot1416 = 1\cdot0053$ in.

And $\frac{1\cdot0053 + 7}{2} = 4\cdot0026$ in. circumference of half-crown.

Three men bought a grindstone of 36 inches in diameter, which cost 20*s.* 3*d.*, of which sum A paid 11*s.* 3*d.*, B 5*s.*, and C 4*s.*, how much of the stone should each man in the order A, B, and C, grind down proportionally to the money he paid.



Here A F = 36 in., A O = 18 in.

Then as $\sqrt{20\cdot25} : \sqrt{9} :: 18 : 12$ in. B O;

And as $\sqrt{9} : \sqrt{4} :: 12 : 8$ in. C O.

Hence $18 - 12 = 6$ in., A's share;

And $12 - 8 = 4$ in., B's share;

And 8 in. = C's share.

App. X. No. 3.

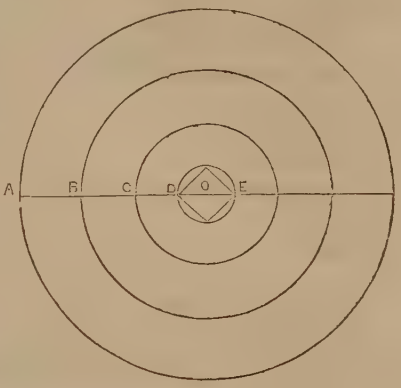
Suppose the grindstone to have been 35 inches in diameter, and to have cost 23*s.* 6*d.*, of which A paid 8*s.* 6*d.*, B 9*s.* 9*d.*, C 5*s.* 3*d.*, if an allowance of five inches square be made for the waste hole through which the spindle passes, how much of the radius ought each man to grind down?

Here the diagonal of the waste hole $= \sqrt{50}$ in.;

And $35^2 : 50 :: 1 : \frac{50}{1225}$ in.

$1 - \frac{50}{1225} = \frac{1175}{1225}$, the part for use in the circle D E.

Therefore, as $1175 : 50 :: 23{\cdot}5 : 1s.$, value of waste hole.



Again, as $\sqrt{24{\cdot}5} : \sqrt{16} :: 17{\cdot}5 : 14{\cdot}1421 =$ B O;

And as $\sqrt{16} : \sqrt{6{\cdot}25} :: 14{\cdot}1421 : 8{\cdot}8388 =$ C O;

And as $\sqrt{6{\cdot}25} : \sqrt{1} :: 8{\cdot}8388 : 3{\cdot}5355 =$ D O;

Hence $17{\cdot}5 - 14{\cdot}1421 = 3{\cdot}3579$ in. A's share;

And $14{\cdot}1421 - 8{\cdot}8388 = 5{\cdot}3033$ in. B's share.

And $8{\cdot}8388 - 3{\cdot}5355 = 5{\cdot}3033$ in. C's share.

Find the solidity of a cylindrical pillar $13\frac{1}{2}$ ft. high and 4 ft. 8 in. in circumference; and also the cost of painting the lateral surface of 14 such pillars at 9*d.* per square yard.

Here, $\frac{1}{4}\left(\frac{4\frac{2}{3}^2}{3{\cdot}1416}\right) \times 13\frac{1}{2} = 23{\cdot}396$ cubic feet in cylinder.

Again $\frac{13\frac{1}{2} \times 4\frac{2}{3} \times 14 \times 9}{9} = 882$ pence $= 3l.\ 13s.\ 6d.$ 2nd Answer.

Find the least possible loss of weight in turning a ball out of a $1\frac{1}{2}$-in. cube of ivory, the weight of ivory being 1825 oz. per cubic foot.

Here, volume of cube $= 1{\cdot}5^3$ in.;

And $1{\cdot}5^3 \times 5236 =$ volume of inscribed sphere.

And $1{\cdot}5^3 \times (1 - 5236) =$ loss of volume in cube.

Therefore, $\frac{1825}{1728} \times 1{\cdot}5^3 \times {\cdot}4764 = 1{\cdot}698$ oz. Answer.

If a 12 lb. shot have a diameter of 4·368 inches, what is the diameter of a 32 lb. shot?

Here, $\sqrt[3]{12} : \sqrt[3]{32} :: 4{\cdot}368$.

Hence, $\frac{2 \times 4{\cdot}368}{1{\cdot}442} = 6{\cdot}057$ in. Answer.

If a 32 lb. shot has a diameter of 6·057 inches, what is the weight of a shot whose diameter is 3·97 inches?

Here, as $6{\cdot}057^3 : 3{\cdot}97^3 :: 32.$

Hence, $\frac{62{\cdot}57777 \times 32}{222{\cdot}21457} = 9{\cdot}001$ lbs. Answer.

What is the least possible loss of material in cutting a cube out of a sphere of elm 4 in. in diameter?

Here, $4^3 \times {\cdot}5236 = 33{\cdot}5104$ volume of sphere.

Again in fig. 2, $AD^2 = AC^2 + CD^2$;

And $AC^2 = AB^2 + BC^2$;

$\therefore AB^2 + BC^2 + DC^2 = AD^2$.

Hence, $\sqrt{\frac{16}{3}} = 2{\cdot}3094 =$ AB;

And $2{\cdot}3094^3 = 12{\cdot}1936 =$ vol. of cube.

Fig. 1.

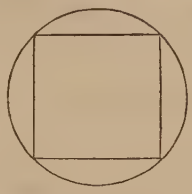
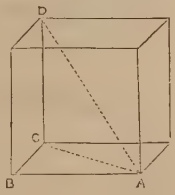


Fig. 2.



$\therefore 33{\cdot}5104 - 12{\cdot}1936 = 21{\cdot}1936$ in. the loss.

If 800 square inches of gold leaf gild a spherical ball weighing 681½ lbs., how many will gild a ball of the same material weighing 1,338¼ lbs.?

Here the diameters are as $\sqrt[3]{681\frac{1}{2}} : \sqrt[3]{1338\frac{1}{4}}$.

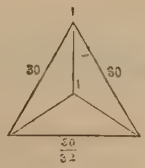
$\therefore$ as $(\sqrt[3]{681{\cdot}5})^2 : (\sqrt[3]{1338{\cdot}25})^2 :: 800.$

$$\frac{121{\cdot}4404 \times 800}{77{\cdot}44} = 1254{\cdot}5. \text{ Answer.}$$

Artillery Subjects.

Required, the No. of shot in a triangular pile, each side of the base containing 30 shot.

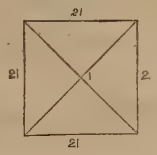
$$\frac{32 \times 15 \times 31}{3} = 4960 \text{ No. of balls.}$$



App. X. No. 3.

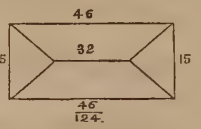
How many shot in a finished square pile when a side of the base contains 21 shot?

$$\frac{43 \times 11 \times 21}{3} = 3311 \text{ No. of balls.}$$



How many shot are in a rectangular complete pile, the length of the bottom course being 46 and its breadth 15?

Here, $\frac{124 \times 8 \times 15}{3} = 4960$ No. of balls.



How many shot are there in an unfinished triangular pile, a side of whose base contains 23 and a side of the uppermost course 7 shot?

Here $\frac{25 \times 12 \times 23}{3} = 2300$, if complete.

$\frac{8 \times 3 \times 7}{3} = 56$, the No. to be taken from pile.

Therefore $2330 - 56 = 2244$ No. of balls.

How many shot are there in an incomplete rectangular pile of 12 courses, the length and breadth of the base being 20 and 40?

Here $\frac{101 \times 10 \times 21}{3} = 7070$, if it were complete.

$\frac{77 \times 4 \times 9}{3} = 924$, the No. to be taken away.

Therefore $7070 - 924 = 6146$, No. of balls.

Mechanics.

In a lever of the first kind the long arm is 2 ft., the short arm is 3 in. What must be the power to balance a weight of 64 lbs.?

Here $\frac{64 \times 3}{24} = 8$ lbs.

1st kind.

How far from the fulcrum must a power of 7 lbs. be applied to balance a weight of 126 lbs. placed at the distance of 2 in. from the fulcrum?

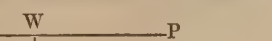
$$\text{Here } \frac{126 \times 2}{7} = 36 \text{ inches.}$$

In the handle of a common pump the piston rod is placed at 3 in. from the fulcrum, a power of 60 lbs. is applied at the distance of 30 in. from the fulcrum. What will be the force lifting the piston?

$$\text{Here } \frac{60 \times 30}{3} = 600 \text{ lbs.}$$

In a lever of the second kind the power acts at 5 ft. and the weight at 2 in. from the fulcrum. Required, the power necessary to balance a weight of 4 cwt.

$$\text{Here } \frac{4 \times 112 \times 2}{60} = 14{\cdot}9\dot{3}.$$



In a lever of the third kind the weight is 28 lbs., and is 20 in. from the fulcrum. Required, the power to lift it at a distance of 7 in. from the fulcrum.

$$\text{Here } \frac{28 \times 20}{7} = 80 \text{ lbs.}$$

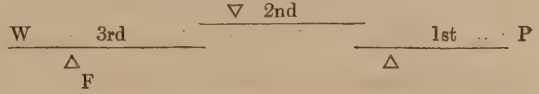
In a combination of three levers of the first kind the long arms are 3, 2, and 5 ft. respectively, and the short arms 6, 4, and 2 in. respectively, if a pressure of 8 lbs. be applied what weight will it balance?

Here, $\frac{2 \times 12 \times 8}{4} = 48$ lbs., 1st lever;

„ $\frac{48 \times 3 \times 12}{6} = 288$ lbs., 2nd lever;

„ $\frac{288 \times 5 \times 12}{2} = 8640$ lbs., 3rd lever;

And, $\frac{8640}{112 \times 20} = 3{\cdot}857142\dot{}$ tons. Answer.



To find the Weight and Diameter of Shot.

Required the weight of a solid shot whose diameter is 8 in.

Here, $\frac{9 \times 8^3}{64} = 72$ lbs., or $4^3 : 8^3 :: 9$ lbs. : 72 lbs.

App. X. No. 3.

Required the diameter of a solid shot whose weight is 56 lbs.

Here, $\sqrt[3]{\frac{64 \times 56}{9}} = 7{\cdot}35$. Answer.

What is the weight of an iron shell, supposing the external diameter to be 13 in. and the internal diameter 9 in.?

Here, $\frac{13^3 \times 9}{64} = 308{\cdot}95$ lbs., the weight, supposing it to be solid; and, $\frac{9^3 \times 9}{64} = 102{\cdot}51$ lbs., the part to be taken from the whole. Therefore, $308{\cdot}95 - 102{\cdot}51 = 206{\cdot}44$, the weight of the shell.

How many lbs. of gunpowder are required to fill a hollow shell whose internal diameter is 9 in.

Here, $\frac{9^3}{57{\cdot}3} = 12{\cdot}72$ lbs. Answer.

What would be the length of one degree on the tangent scale of a 68-pounder gun, whose length is $10\frac{1}{2}$ feet?

$\frac{10{\cdot}5 \times 12 \times 2 \times 3{\cdot}1416}{360} = 2{\cdot}19912$ in. Answer.

Supposing the circumference of the breech and muzzle of a gun to be 6 ft. and 4 ft. 9 in. respectively, what would be the dispart in degrees, the gun being 10 ft. long?

Here, $\frac{72}{3{\cdot}1416} - \frac{57}{3{\cdot}1416} \times \frac{1}{2} = 2{\cdot}3873$ in., the length of the dispart, in inches;

And, $\frac{10 \times 12 \times 2 \times 3{\cdot}1416}{360} = 2{\cdot}0944$ in., the length of one degree,

$\therefore \frac{2{\cdot}3873}{2{\cdot}0944} = 1{\cdot}14$ in., dispart in degrees.

Supposing a 13-inch shell to be fired from a mortar at 45° elevation, and the time of flight to be 7 seconds, what would be the range?

Here, $\frac{(7 \times 4{\cdot}5)^2}{3} = 330{\cdot}75$ yards. Answer.

If the range of a 13-inch mortar be 2,000 yards, what will be the time of flight of the shell and the length of fuze required?

Here, $\frac{\sqrt{2000 \times 3}}{4{\cdot}5} = 17{\cdot}2$ seconds, time of flight; and as $5\frac{1}{2}$ inches of fuze burn 18 seconds, it will take about $5{\cdot}4$ in. for $17{\cdot}2$ seconds.

Mechanics.

Wheel and Axle.

No. 1. The handle of a windlass is $2\frac{1}{2}$ feet, the radius of the axle is $2\frac{1}{4}$ inches, and the power applied 90 lbs.; required the weight which would be raised were there no friction.

Here, work of P in 1 rev. $= 90 \times 2\frac{1}{2} \times 12 \times 2 \times 3{\cdot}1416$;

„ W „ $= 2\frac{1}{4} \times 2 \times 3{\cdot}1416$;

Therefore, $\frac{90 \times 2{\cdot}5 \times 12 \times 2 \times 3{\cdot}1416}{2{\cdot}25 \times 2 \times 3{\cdot}1416} = 1{,}200$ lbs. Answer.

No. 2. What must be the diameter of the axle in the last example so that the weight raised may be 1 ton?

Here, work of P in 1 rev. $= 3{\cdot}1416 \times 2{\cdot}5 \times 12 \times 2 \times 90$;

„ W „ $= 3{\cdot}1416 \times 1 \times 20 \times 112$;

Therefore, $\frac{3{\cdot}1416 \times 2{\cdot}5 \times 12 \times 2 \times 90}{3{\cdot}1416 \times 20 \times 112} = 2{\cdot}4107$ in. Answer.

No. 3. Required W in Example 1, when the thickness of the cord is $1\frac{1}{2}$ in., supposing that $\frac{2}{7}$ of the work applied be lost by friction and the rigidity of the cord.

Here, work of P in 1 rev. $= 90 \times 2{\cdot}5 \times 12 \times 2 \times 3{\cdot}1416 \times 5$;

„ W „ $= 3 \times 2 \times 3{\cdot}1416 \times 7$;

Therefore, $\frac{90 \times 2{\cdot}5 \times 12 \times 2 \times 3{\cdot}1416 \times 5}{3 \times 2 \times 3{\cdot}1416 \times 7} = 642\frac{6}{7}$ lbs. Answer.

Cogged or Toothed Wheels.

1. Let P equal 30 lbs., the diameter of the wheel C = 2 ft., the number of teeth in D = 8, the number in $q = 56$, and the diameter of the axle I = $\frac{1}{4}$ ft.; required W that equilibrium may take place.

Here, work of P $= 30 \times 2 \times 3{\cdot}1416 \times 56$;

„ W $= {\cdot}25 \times 8 \times 3{\cdot}1416$;

Therefore, $\frac{30 \times 2 \times 3{\cdot}1416 \times 56}{{\cdot}25 \times 3{\cdot}1416 \times 8} = 1680$ lbs.

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2. In a crane the length of the handle or radius of wheel C is 1·4 ft., the number of teeth in the cog D is 8, the number in the wheel q is 40, and the diameter of the axle I is 4 in.; if a pressure of 60 lbs. be applied to the handle, what must be the weight raised?

Here, $60 \times 1{\cdot}4 \times 2 \times 40 = 8 \times \frac{1}{3} \times W$.

W = 2520 lbs. Answer.

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3. What must be the number of teeth in the wheel q of Example 2, so that a weight of 5 tons may be raised.

Here, $60 \times 1{\cdot}4 \times 2 \times q = 8 \times \frac{1}{5} \times 11200$.

$q = 177{\cdot}7$. Answer.

Compound Wheel and Axle.

No. 1. In a compound wheel and axle the handle is 20 in., the radius of the large part of the wheel is 3 in., and of the small part 2 in.; if

App. X. No. 3.

10 lbs. pressure be applied to the handle, how many lbs. would be raised by the machine?

$$\text{Here } \frac{(3 \times 2 \times 3{\cdot}1416) - (2 \times 2 \times 3{\cdot}1416)}{2} = 3{\cdot}1416.$$

$$\text{Then } \frac{3{\cdot}1416 \times 10 \times 20 \times 2}{3{\cdot}1416} = 400 \text{ lbs. Answer.}$$

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2. Required, the power, when the diameters of the axles are ·4 and ·6 ft. respectively, the length of the handle 1·5 ft., and the weight to be raised 600 lbs.

$$\text{Here } \frac{(\cdot 6 \times 3{\cdot}1416) - (\cdot 4 \times 3{\cdot}1416)}{2} = \cdot 31416.$$

$$\text{Then } \frac{\cdot 31416 \times 600}{3{\cdot}1416 \times 1{\cdot}5 \times 2} = 20 \text{ lbs. Answer.}$$

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3. What must be the radius of the large part of the axle in Example 1, so that the weight raised may be 1600 lbs.?

Let x = the radius.

$$\text{Then } 2 \times 20 \times 10 = \frac{x - 2}{2} \times 1600 \text{ by question.}$$

$$400 = 800\,x - 1600$$

$$\therefore x = \frac{2000}{800} = 2{\cdot}5 \text{ in. Answer.}$$

The Pulley.

Let there be two moveable pulleys, each weighing 6 lbs., then if P = 150, it is required to determine W.

Here, work of P = 150×4, if P descend 4 ft.

„ $W = (W \times 1) + (1 \times 6) + (6 \times 2) = W + 18$;

Then $W + 18 = 150 \times 4$.

$W = 600 - 18 = 582$ lbs. Answer.

Required, the same as in the last example, when there are three moveable pulleys.

Here $(W \times 1) + (1 \times 6) + (2 \times 6) + (6 \times 4) = 150 \times 8$.

$W = 1158$. Answer.

If the weight of the moveable pulley nearest the power = 2 lbs., the weight of the other moveable pulley = 6 lbs., and W = 600 lbs.; required P.

$$\text{Here } \frac{600 + 6}{3} = 202 \text{ lbs.;}$$

$$\text{Then } \frac{202 + 2}{3} = 68 \text{ lbs., the power required.}$$

Inclined Plane.

The length of an inclined plane is 3 ft., the perpendicular height 2 ft., and the weight of the body 12 lbs., what pressure will be required to sustain the body on the plane, friction being neglected?

Here let P = power;
Then $3 \times P = 2 \times 12$ by question;
$3\,P = 24$;
$\therefore P = \frac{24}{3} = 8$ lbs. Answer.

Required, the same as in the last example, when the length of the plane is 100 ft., the height 20 ft., and the weight 40 lbs.

Here let P = power;
Then $100 \times P = 40 \times 20$ by question;
$100\,P = 800$;
$\therefore P = \frac{800}{100} = 8$ lbs. Answer.

The length of an inclined plane is 100 ft., the height 3 ft., the weight of the body 50 lbs., and the friction $\frac{1}{280}$ part of the weight; what pressure will be required to move the body up the plane?

Here $P \times 100 = 3 \times 50$ by question;

$P = \frac{3}{2}$ without friction;

And $50 \times \frac{1}{280} = \frac{5}{28}$ friction $\therefore \frac{3}{2} + \frac{5}{28} = \frac{94}{56} = 1\frac{19}{28}$ lbs. Answer,
or 1·67857 lbs.

Required, the same as in the last example, when the length of the plane is 100 ft., the height 2 ft., and the weight of the body 56 lbs.

Here let P = power;
Then $100 \times P = 2 \times 56$ by question;
$100\,P = 112$;

$P = \frac{28}{25}$ without friction;

But friction $= \frac{56}{1} \times \frac{1}{280} = \frac{1}{5} \therefore \frac{28}{25} + \frac{1}{5} = \frac{33}{25} = 1{\cdot}32$ lbs. Answer.

The length of an inclined plane is 100 ft., the height ·2 ft., the weight of the body 90 lbs., and the coefficient of friction $\frac{1}{30}$; required, the pressure necessary to move the body down the plane.

Here let P = power;
Then $\cdot 2 \times 90 = 100 \times P$;
$\therefore 100\,P = 18$;
but $P = \frac{18}{100} = \frac{9}{50}$ lb. Power without friction.

But friction $= 90 \times \frac{1}{30} = 3$ lbs. $\therefore 3 - \frac{9}{50} = \frac{141}{50} = 2{\cdot}82$ lbs. Answer.

App. X. No. 3.

Required, the number of men necessary to parbuckle a 68-pounder gun up an inclined plane whose length is 30 ft., and perpendicular height 5 ft., supposing the gun to weigh 112 cwt. and a man to exert a pressure of 80 lbs.

Here let P = power;

Then $P \times 30 \times 80 = 5 \times 112 \times 112$ by question;

$2400\,P = 62720$;

$$P = \frac{62720}{2400} = 26\,\frac{2}{15}.$$

$$\text{And } 26\,\frac{2}{15} \times \frac{1}{2} = 13\,\frac{1}{15} \text{ men. Answer.}$$

Required, the power necessary to mount a 68-pounder gun weighing 112 cwt., with a gyn and tackle consisting of one lever 5 ft. long and two moveable pulleys, the diameter of the windlass being 8 inches, supposing $\frac{2}{3}$ of the power to be wasted by friction.

Here $\frac{112}{2} = 56$ cwt., weight on 2nd block;

$\frac{56}{2} = 28$ cwt., weight on windlass.

Again $P = 5 \times 12 \times 2 \times 3{\cdot}1416$;

$W = 8 \times 28 \times 3{\cdot}1416$;

Therefore $\frac{8 \times 28 \times 3{\cdot}1416}{5 \times 12 \times 2 \times 3{\cdot}1416} = \frac{28}{15} = 1\,\frac{13}{15}$ cwt., power required without friction; and $1\,\frac{13}{15} \times \frac{5}{3} = 3\,\frac{1}{9}$, answer with friction.

Required, the power necessary to mount a 56-pounder gun weighing 65 cwt., with a gyn and tackle consisting of one lever 4·5 ft. long, and double and triple blocks, the diameter of the windlass being 6 in., supposing $\frac{2}{3}$ of the power to be wasted by friction.

Here $65 \times \frac{2}{3} = \frac{130}{3}$, increase of weight by friction;

$\frac{130}{3} + 65 = \frac{325}{3}$, weight to be raised with friction;

$\frac{325}{3} \times \frac{1}{4} = \frac{325}{12}$, weight sustained by windlass.

Again $P = 4{\cdot}5 \times 12 \times 2 \times 3{\cdot}1416$;

and $W = 6 \times \frac{325}{12} \times 3{\cdot}1416$;

Then $\frac{6 \times \frac{325}{12} \times 3{\cdot}1416.}{4{\cdot}5 \times 12 \times 2 \times 3{\cdot}1416} = 1{\cdot}5$ cwt. Answer.

The Moveable Inclined Plane or Wedge.

The length of a wedge = 1·5 feet, the thickness = ·2 feet, the pressure applied = 100 lbs.; required the weight that would be raised?

Here let W = weight;

Then W × ·2 = 100 × 1·5 by question;

$$\therefore W = \frac{150}{\cdot 2} = 750 \text{ lbs.} \quad \text{Answer.}$$

Required the same as in last example when length = 2 feet, thickness = ·4 feet, and pressure 400 lbs.

Here let W = weight;

Then W × ·4 = 400 × 2;

$$W = \frac{800}{\cdot 4} = 2000 \text{ lbs.} \quad \text{Answer.}$$

The Screw.

The lever of a simple screw is 2 feet, the thickness of the thread ·2 feet; if a pressure of 100 lbs. be applied to the lever, what pressure will be produced on the press-board?

Here P = 100 × 2 × 2 × 3·1416 in 1 revolution.

and W = ·2 × W.

$$\therefore \frac{100 \times 2 \times 2 \times 3 \cdot 1416}{\cdot 2} = 6283 \cdot 2 \text{ lbs.} \quad \text{Answer.}$$

The lever of a screw is 3 feet, and the thickness of the threads $\frac{1}{4}$ inch; required the pressure that must be exerted on the lever so as to produce a pressure of 10 tons on the press-board.

Here W = $10 \times 20 \times 112 \times \frac{1}{4}$

And P = $3 \times 12 \times 2 \times 3 \cdot 1416 = 24 \cdot 7$ lbs. Answer.

What must be the thickness of the threads of the screw in Example 1 so that a pressure of 5000 lbs. may be produced on the press-board.

Here P = 100 × 2 × 2 × 3·1416;

And W = 5000 lbs.;

$$\therefore \frac{100 \times 2 \times 2 \times 3 \cdot 1416}{5000} = \cdot 25 \text{ feet.} \quad \text{Answer.}$$

Compound Screw.

In a compound screw the length of the lever is 1·5 feet, the distance between the threads of the large or hollow screw is $\frac{3}{4}$ inch, and that of the small one $\frac{1}{2}$ inch; if 30 lbs. pressure be applied to the lever, what will be the pressure on the press-board?

Here $\frac{3}{4} - \frac{1}{2} = \frac{1}{4}$ in. press-board descends in 1 revolution;

And W in 1 revolution = W × $\frac{1}{4}$;

And P „ = 30 × 1·5 × 2 × 3·1416 × 12;

$$\therefore W = \frac{30 \times 1 \cdot 5 \times 2 \times 3 \cdot 1416 \times 12}{\frac{1}{4}} = 13571 \cdot 712 \text{ lbs.} \quad \text{Answer.}$$

App. XI.

What pressure must be applied to the lever in Example 1 so that a pressure of 4 tons may be given to the press-board?

Here $\frac{3}{4} - \frac{1}{2} = \frac{1}{4}$ in. press-board descends in 1 rev.

And W in 1 rev. $= 4 \times 20 \times 112 \times \frac{1}{4}$;

and P „ $= 1{\cdot}5 \times 2 \times 3{\cdot}1416 \times 12$;

$$\therefore P = \frac{4 \times 20 \times 112 \times \frac{1}{4}}{1{\cdot}5 \times 2 \times 3{\cdot}1416 \times 12} = 19{\cdot}8 \text{ lbs.}$$ Answer.

Appendix XI.

Attendance of Children.

Table showing the Number of Children in Regimental Schools receiving Instruction from the Schoolmaster and Schoolmistress, and of those attending the Industrial Schools, for the Years 1863–1864.

Regiment.	Station.	Under Schoolmaster.		Under Schoolmistress.		Total.	Attending Industrial School.
		Boys.	Girls.	Boys.	Girls.		
1st Life Guards	London	17	15	23	26	81	44
2nd Life Guards	London	33	14	24	24	95	43
R. Horse Guards	Windsor	10	3	10	32	55	36
1st Drag. Guards	Madras	26	19	17	18	80	34
2nd „	Bengal	3	4	—	—	7	7
3rd „	Bombay	11	12	22	6	51	17
4th „	Dublin	15	14	11	15	55	40
5th „	Cahir	17	16	18	15	66	48
6th „	Aldershot	15	10	20	13	58	44
7th „	Bengal	9	7	5	7	28	19
1st Dragoons	Aldershot	9	10	14	13	46	35
2nd „	Birmingham	13	5	18	12	48	27
3rd Hussars	Edinburgh	16	14	23	19	72	50
4th „	Newbridge	21	25	20	17	83	54
5th Lancers	Norwich and Bengal.	6	3	18	15	42	7
6th Dragoons	Bombay	16	6	11	5	38	21
7th Hussars	Bengal	2	4	2	4	12	10
8th „	Bengal	13	2	3	3	21	8
9th Lancers	Brighton	6	5	6	8	25	11
10th Hussars	Dublin	11	6	19	15	51	40
11th „	Cahir and Dublin	3	5	9	7	24	17
12th Lancers	Aldershot and Hounslow.	5	7	9	9	30	24
13th Hussars	Aldershot	15	9	19	27	70	55
14th „	Manchester	12	12	11	10	45	32
15th „	Dundalk and Newbridge	15	5	9	11	40	35
16th Lancers	York	14	3	10	13	40	16
17th „	Madras	14	11	4	11	40	22
18th Hussars	Hounslow and Norwich.	6	6	11	12	35	17

Regiment.	Station.	Under Schoolmaster.		Under Schoolmistress.		Total.	Attending Industrial School.
		Boys.	Girls.	Boys.	Girls.		
19th Hussars -	Bengal - -	8	4	4	4	20	8
20th „ -	Bengal - -	17	14	2	1	34	13
21st „ -	Bengal - -	1	—	1	5	7	5
1st B. Mil. Train	Woolwich - -	6	5	12	18	41	23
2nd „ -	- - - -						
3rd „ -	Montreal - -						
4th „ -	- - - -						
5th „ -	- - - -						
6th „ -	Curragh - -	—	3	5	9	17	13
Depôt - -	Maidstone - -	15	8	21	16	60	44
Depôt - -	Canterbury -	19	18	29	39	105	85
1st B. Gren. Gds.	Montreal - -	3	10	8	6	27	23
2nd „ -	London - -	12	7	13	8	40	27
3rd „ -	London and Windsor.	6	7	5	7	25	18
1st B. Coldstream Guards.	London - -	5	2	2	7	16	6
2nd „ -	Windsor and London.	9	7	9	6	31	14
1st B. Scots Fusilier Guards.	London - -	15	11	10	19	55	40
2nd „ -	Montreal - -	4	3	8	8	23	18
1st B. 1st Foot -	Madras - -	15	7	5	3	30	8
2nd „ -	Aldershot and Portsmouth.	9	4	7	10	30	22
1st B. 2nd Foot -	Devonport -	20	19	33	40	112	92
2nd „ -	Gibraltar - -	15	6	9	8	38	20
1st B. 3rd Foot -	Aldershot - -	28	14	8	9	59	26
2nd „ -	Gibraltar - -	11	5	8	11	35	24
1st B. 4th Foot -	Bombay - -	17	17	16	9	59	38
2nd „ -	Corfu - -	3	6	11	11	31	20
1st B. 5th Foot -	Shorncliffe - -	10	7	6	7	30	7
2nd „ -	Natal - -	10	8	8	10	36	8
1st B. 6th Foot -	Gosport and Aldershot.	5	3	6	7	21	16
2nd „ -	Corfu - -	15	8	7	11	41	22
1st B. 7th Foot -	Bengal - -	3	5	1	2	11	7
2nd „ -	Gibraltar and Malta.	11	4	9	16	40	25
1st B. 8th Foot -	Sheffield - -	11	9	13	12	45	31
2nd „ -	Gibraltar and Malta	24	21	21	15	81	48
1st B. 9th Foot -	Cephalonia -	18	16	26	20	80	37
2nd „ -	Corfu - -	19	11	38	38	106	73
1st B. 10th Foot -	Curragh and Kilkenny.	6	8	13	12	39	32

APP. XI.

Regiment.	Station.	Under Schoolmaster.		Under Schoolmistress.		Total.	Attending Industrial School.
		Boys.	Girls.	Boys.	Girls.		
2nd B. 10th Foot	King William's Town, Cape.	27	10	22	27	86	58
1st B. 11th Foot	Curragh and Dublin.	10	9	19	17	55	45
2nd „	Cape	19	12	12	12	55	36
1st B. 12th Foot	Sydney, N.S.W.	19	15	37	17	88	29
2nd „	Curragh and Dublin.	10	10	16	22	58	46
1st B. 13th Foot	Bengal	9	7	4	5	25	8
2nd „	Mauritius	25	6	19	19	69	25
1st B. 14th Foot	Jamaica and Trinidad.	13	17	11	9	50	33
2nd „	New Zealand	13	9	20	16	58	—
1st B. 15th Foot	New Brunswick	30	19	—	—	—	—
2nd „	Malta and Gibraltar.	11	8	19	21	59	47
1st B. 16th Foot	Canada	13	11	19	19	62	48
2nd „	Halifax, N.S.	8	15	16	17	56	47
1st B. 17th Foot	Halifax and Quebec.	18	20	18	12	68	26
2nd „	Halifax	13	13	19	19	64	51
1st B. 18th Foot	Madras	8	14	18	18	58	21
2nd „	- - - -	17	11	12	13	53	22
1st B. 19th Foot	Bengal	14	13	3	7	37	21
2nd „	Dublin and Burmah.	7	9	11	13	40	23
1st B. 20th Foot	Bengal	11	1	2	5	19	10
2nd „	Portsmouth and Bengal.	11	9	19	21	60	45
1st B. 21st Foot	Barbadoes	26	26	16	13	81	48
2nd „	Curragh and Madras.	19	14	16	15	64	45
1st B. 22nd Foot	Malta	19	11	13	21	64	31
2nd „	Malta	18	21	15	18	72	46
1st B. 23rd Foot	Bengal	21	11	10	1	43	21
2nd „	Malta and Gibraltar.	6	7	12	13	38	31
1st B. 24th Foot	Aldershot	15	12	14	12	53	22
2nd „	Mauritius	4	3	14	8	29	26
1st B. 25th Foot	Malta	13	6	12	19	50	36
2nd „	Edinburgh and Ceylon.	13	14	14	17	58	16
26th Foot	Portsmouth	27	16	16	16	75	40
27th „	Bengal	14	18	10	7	49	20
28th „	Bombay	18	20	10	7	55	26
29th „	Curragh and Dublin.	7	13	10	11	41	35
30th „	Canada	14	16	21	15	66	53
31st „	No report.						
32nd „	Curragh and Dublin.	5	2	7	7	21	15
33rd „	Bombay	25	22	13	24	84	49
34th „	Bengal	4	4	4	4	16	7
35th „	Bengal	20	25	6	6	57	25

Regiment.	Station.	Under Schoolmaster.		Under Schoolmistress.		Total.	Attending Industrial School.
		Boys.	Girls.	Boys.	Girls.		
36th Foot - -	Dublin - -	13	10	18	11	52	39
37th „ - -	Aldershot - -	6	4	12	18	40	33
38th „ - -	Bengal - -	5	7	9	11	32	20
39th „ - -	Bermuda - -	23	13	36	32	104	68
40th „ - -	New Zealand -	9	8	24	12	53	50
41st „ - -	Glasgow - -	14	18	17	16	65	20
42nd „ - -	Bengal - -	7	10	9	5	31	30
43rd „ - -	Bengal - -	5	2	10	1	137	93
44th „ - -	Bombay - -	31	31	14	15	91	60
45th „ - -	Curragh - -	12	6	8	9	35	22
46th „ - -	Bengal - -	7	—	5	24	36	29
47th „ - -	Kingston (C.W.)-	10	10	15	17	52	37
48th „ - -	Bengal - -	24	25	8	9	66	23
49th „ - -	Manchester -	17	28	12	17	74	56
50th „ - -	Ceylon - -	9	13	14	14	50	27
51st „ - -	Bengal - -	12	8	9	7	36	23
52nd „ - -	Bengal - -	24	16	12	9	61	21
53rd „ - -	Portsmouth -	6	6	16	17	45	38
54th „ - -	Bengal - -	4	7	20	12	43	—
55th „ - -	Portsmouth -	15	13	30	26	84	49
56th „ - -	Bombay - -	2	2	4	10	18	12
57th „ - -	New Zealand -	30	34	12	11	87	58
58th „ - -	Dublin and Newry	14	13	9	14	50	32
59th „ - -	Aldershot - -	25	24	18	14	81	56
1st B. 60th Rifles	London (Tower)-	24	21	12	12	69	41
2nd „ -	Aldershot - -	11	12	9	10	42	30
3rd „ -	Burmah - -	14	11	7	6	38	20
4th „ -	Montreal - -	8	5	19	9	41	33
61st Foot - -	Jersey - -	5	8	9	14	36	20
62nd „ - -	Quebec - -	14	7	14	17	52	35
63rd „ - -	London (C.W.) -	15	11	15	15	56	32
64th „ - -	Aldershot and Gosport.	19	17	18	19	73	38
65th „ - -	New Zealand -	22	20	19	16	77	54
66th „ - -	Madras - -	25	14	9	6	54	17
67th „ - -	China - -	5	3	1	1	10	—
68th „ - -	Rangoon - -	16	12	8	4	40	20
69th „ - -	Madras - -	14	8	7	4	33	11
70th „ - -	New Zealand -	8	5	6	11	30	—
71st „ - -	Bengal - -	11	11	10	10	42	20
72nd „ - -	Bombay - -	13	2	4	9	28	14
73rd „ - -	Aldershot - -	9	9	5	8	31	21
74th „ - -	Madras - -	18	17	8	10	63	54
75th „ - -	Devonport and Aldershot.	11	11	9	6	37	26
76th „ - -	Aldershot - -	18	12	24	28	82	42
77th „ - -	Bengal - -	7	5	5	5	22	10
78th „ - -	Dover - -	9	12	14	24	57	48
79th „ - -	Bengal - -	5	5	—	—	—	—
80th „ - -	Bengal - -	13	15	5	8	41	14
81st „ - -	Bengal - -	31	19	11	7	68	19
82nd „ - -	Bengal - -	12	8	7	6	33	10
83rd „ - -	Shorncliffe - -	10	12	12	12	46	35

App. XI.

Regiment.	Station.	Under Schoolmaster.		Under Schoolmistress.		Total.	Attending Industrial School.
		Boys.	Girls.	Boys.	Girls.		
84th Foot - -	Shorncliffe and Curragh.	12	10	17	10	49	31
85th „ - -	Dover - -	15	12	13	26	55	32
86th „ - -	Curragh and Dublin.	10	8	12	18	48	37
87th „ - -	Aldershot - -	13	11	9	9	42	24
88th „ - -	Bengal - -	6	5	6	11	28	11
89th „ - -	Bengal - -	11	14	6	6	37	15
90th „ - -	Bengal - -	5	6	5	7	23	16
91st „ - -	Bengal - -	25	26	4	5	60	22
92nd „ - -	Edinburgh - -	19	21	8	10	58	38
93rd „ - -	Bengal - -	26	7	12	15	60	22
94th „ - -	Bengal - -	5	—	8	9	22	13
95th „ - -	Bombay - -	15	12	12	13	52	42
96th „ - -	Cape of Good Hope.	1	6	12	13	32	31
97th „ - -	Bengal - -	14	18	2	1	35	15
98th „ - -	Bengal - -	13	13	14	12	52	39
99th „ - -	Hong Kong -	6	2	—	—	8	—
100th „ - -	Gibraltar and Malta.	24	9	12	5	50	25
101st „ - -	Bengal - -	12	13	6	5	36	18
102nd „ - -	Madras - -	22	18	12	19	71	26
103rd „ - -	Bombay - -	19	18	8	20	65	44
104th „ - -	Bengal - -	16	18	4	11	49	27
105th „ - -	Madras - -	42	25	11	9	87	10
106th „ - -	Bombay - -	15	11	9	3	38	11
107th „ - -	Bengal - -	12	9	7	10	38	14
108th „ - -	Madras - -	14	10	5	4	33	14
109th „ - -	Bombay - -	11	12	12	9	44	13
1st Batt. Rifle Brigade.	Hamilton (C.W.)	3	1	9	17	30	16
2nd „ -	Bengal - -	6	7	6	8	27	10
3rd „ -	Bengal - -	4	6	9	3	22	9
4th „ -	Malta and Gibraltar.	6	2	7	3	18	12
1st W. I. Regt. -	Nassau and Barbadoes.	2	6	10	10	28	25
2nd „ -	Nassau - -	11	6	4	12	33	16
3rd „ -	Sierra Leone -	20	13	7	9	49	6
4th „ -	Jamaica and Cape Coast Castle.	6	4	2	2	14	5
5th „ -							
Ceylon Rifles -	Ceylon - -						
Cape Rifles -	Cape - -	31	25	20	15	91	60
Canadian Rifles -	Canada - -	203	168	166	199	736	318
St. Helena Regt. -	St. Helena - -	12	16	21	22	71	36
Malta Fencibles -	Malta - -	13	—	—	—	—	—
Commissariat Staff Corps.	Aldershot - -	2	2	6	7	17	14

Regiment.	Station.	Under Schoolmaster.		Under Schoolmistress.		Total.	Attending Industrial School.
		Boys.	Girls.	Boys.	Girls.		
DEPÔT BATTALIONS.							
1st - -	Chatham - -	28	20	23	24	95	57
2nd - -	Chatham - -	23	12	28	30	93	70
3rd - -	Chatham - -	31	21	20	24	96	58
4th - -	Colchester - -	15	8	19	20	62	47
5th - -	Parkhurst - -	14	11	20	26	1	38
6th - -	Walmer - -	15	12	12	10	49	25
7th - -	Winchester -	20	20	41	30	111	49
8th - -	Pembroke - -	23	20	26	24	93	44
9th - -	Colchester - -	11	12	29	31	83	72
10th - -	Colchester - -	3	9	20	30	62	58
11th - -	Preston - -	22	9	21	23	75	53
12th - -	Athlone - -	39	37	44	38	158	126
13th - -	Birr - -	21	15	24	35	5	74
14th - -	Belfast - -	34	18	32	39	121	83
15th - -	Buttevant - -	20	18	19	17	74	53
16th - -	Templemore -	35	27	37	32	131	93
17th - -	Limerick - -	39	38	38	42	157	114
18th - -	Fermoy - -	29	23	36	42	130	105
19th - -	Fermoy - -	25	15	28	27	92	64
20th - -	Cork - -	30	24	37	35	126	93
22nd - -	Stirling - -	19	19	11	11	60	41
23rd - -	Aberdeen - -	13	21	7	17	58	41
GARRISON SCHLS.							
Staff Children -	Aldershot, Permanent Bks.	—	—	7	11	18	18
„ -	Aldershot N. Cmp.	—	—	26	23	49	53
Military labourers	Barbadoes - -	9	12	10	7	38	28
3rd W. I. Regt. -	Bathurst (Gambia).	16	12	—	—	28	—
Garrison - -	Curragh - -	—	—	48	53	101	124
„ - -	Devonport - -	—	—	22	33	55	74
„ - -	Dublin - -	55	44	47	47	193	138
Sch. of Musketry	Fleetwood - -	3	4	8	3	18	—
„	Hythe - -	4	8	6	4	22	—
Musketry Depôt -	Milton (Gravesend).	—	—	6	15	21	21
R. Vict. Hospital	Netley - -	13	11	22	11	57	25
	Shorncliffe -	12	15	13	16	56	43
	Vic. Lod. House -	—	—	23	39	62	34
ROYAL ARTILLERY.							
1st H. Brigade -	Woolwich - -	74	75	47	59	255	151
2nd „ -	„ - -						
3rd „ -	India - -						
4th „ -	„ - -						
5th „ -	„ - -						
Depôt - -	Canterbury -	13	6	16	10	45	31

App. XI.

Regiment.	Station.	Under Schoolmaster.		Under Schoolmistress.		Total.	Attending Industrial School.
		Boys.	Girls.	Boys.	Girls.		
Head Quarters :—							
1st Brigade - -	Gibraltar - -	34	20	27	21	102	58
2nd „ - -	Dover - -	29	31	25	27	112	60
3rd „ - -	Malta - -	21	12	18	21	72	30
4th „ - -	Aldershot - -	14	5	13	17	49	34
5th „ - -	Plymouth - -	23	26	26	26	101	71
6th „ - -	Portsmouth -	22	37	30	43	132	54
7th „ - -	Gosport - -	33	25	30	33	121	66
8th „ - -	Dublin - -	9	8	11	12	40	30
9th „ - -	Shorncliffe - -	36	24	57	49	166	130
10th „ - -	Montreal - -	20	13	30	61	124	109
11th „ - -	Lucknow - -						
12th „ - -	Mauritius - -	7	5	4	3	19	—
13th „ - -	Woolwich - -	41	24	44	46	155	74
14th „ - -	Ahmedabad, Bombay.	7	6	—	—	13	4
15th „ - -	Halifax (N.S.) -	18	12	12	17	61	41
16th „ - -	No Brigade Returns.						
17th „ - -							
18th „ - -							
19th „ - -							
20th „ - -							
21st „ - -							
22nd „ - -							
23rd „ - -							
24th „ - -							
25th „ - -							
Depôt Brigade -	Sheerness - -	52	35	22	28	137	62
	Woolwich - -	127	77	62	49	315	109
	Warley - -	17	10	15	28	70	54
Detach. 6th Brig.	Alderney - -	9	8	8	10	35	25
	Aldershot - -	31	12	12	15	70	35
„ 8th „ -	Ballincollig -	7	7	19	17	50	23
„ 15th „ -	Bermuda - -			Nil.			
„ 8th „ -	Clonmel - -	—	—	3	9	12	—
„ 3rd „ -	Corfu - -	12	8	13	8	41	—
„ 8th „ -	Devonport - -			Nil.			
„ Coast „ -	Fort George -	13	9	10	8	40	23
„ 6th „ -	Guernsey - -	11	13	6	11	41	30
„ 4th „ -	Hilsea - -	12	8	13	26	59	16
„ 12th „ -	Hong Kong -			Nil.			
„ 15th „ -	Jamaica - -	6	3	8	3	20	—
„ 10th „ -	Kingston (C.W.)-	10	9	12	6	37	26
„ 4th „ -	London (C.W.) -			Nil.			
„ 9th „ -	Leith Fort -	7	12	6	3	28	21
„ 8th „ -	Limerick - -	5	8	9	6	28	—
„ 10th „ -	Newfoundland -	—	—	3	2	5	—
„ Coast „ -	Purfleet - -	2	1	3	6	12	—
„ 10th „ -	Quebec - -	17	11	10	6	44	23
„ Dep. „ -	Shoeburyness -	14	21	22	27	84	51
„ Coast „ -	Shoreham - -	1	—	2	1	4	1
„ Coast „ -	60 Tower - -	1	5	3	1	10	8
„ 12th „ -	St. Helena -	10	9	2	3	24	23
„ 10th „ -	Toronto (C.W.) -	4	8	7	4	23	18

Regiment.	Station.	Under Schoolmaster.		Under Schoolmistress.		Total.	Attending Industrial School.
		Boys.	Girls.	Boys.	Girls.		
Detach. Coast Brig.	Tynemouth Castle	8	7	—	—	15	—
Garrison - -	Woolwich Common.	19	18	39	64	140	64
	Woolwich, Cambridge Cottages.	—	—	22	19	41	22
Royal Engineers.							
	Aldershot - -	21	12	20	21	74	53
	Chatham - -	62	37	48	45	192	130
	Corfu - -	6	—	6	8	20	13
	Gibraltar - -	9	5	17	15	46	37
	London (C.W.) -	Nil.					
	Malta - -	4	2	7	8	21	10
	Woolwich - -	Nil.					
	Total -	4,212	3,402	4,027	4,240	15,881	9,402

Appendix XII.

Circular No. 840.—Army Schools.

HOME AND FOREIGN.

War Office, *29th October* 1863.

In circulating the annexed Revise of the Army School Regulations, which is accompanied by an Index and a Copy of Horse Guards Circular Memorandum, 5th October 1863, attention is drawn to Articles 21, 23, 35, 43, 69, 101, and 125, which have been altered, and are now printed as approved by H.R.H. the Field Marshal Commanding-in-Chief and the Secretary of State for War. 50 General No. 496

Edward Lugard.

Circular No. 821.—Army Schools.

HOME AND FOREIGN.

War Office, *25th May* 1863.

The annexed Regulations for the Management of Army Schools having been approved by His Royal Highness the Field 56 General No. 485

App. XII.

Marshal Commanding-in-Chief, and by the Secretary of State for War, are to take effect from this date.

No Schoolmaster now in the Service is compelled to accept the new Regulations as regards Pay, Pension, and Promotion. Six months from the present date will be allowed for consideration; and at the expiration of that time all who have not signified their wish to be placed under these Regulations will be borne upon a separate list, their pay, pensions, &c. being continued according to previous Regulations; but they will be amenable to all directions contained in the new Regulations which relate to conduct, discipline, and general duties.

Schoolmasters, by declining to accept the new Regulations, will not be rendered ineligible for promotion to the rank of Superintending Schoolmaster.

EDWARD LUGARD.

REGULATIONS for the MANAGEMENT of ARMY SCHOOLS.

Adult and grown children's schools.

1. Army schools are established for the purpose of affording to non-commissioned officers and soldiers, and to their children, the opportunity of acquiring a sound and useful education.

2. These schools are under the supervision of the Council of Military Education.

Schoolmasters.

3. The trained schoolmasters of the army are of two classes, viz., "superintending schoolmasters," who are commissioned officers, with relative rank as ensigns; and "schoolmasters," who rank as non-commissioned officers next below serjeant majors.

Both classes are subject to the Mutiny Act, to the Articles of War, and to the General Regulations and Orders of the Army.

Schoolmasters are not under the authority of any non-commissioned officer in regard to the duties of their office.

Pay of trained army schoolmasters.

4. The pay of trained army schoolmasters is as follows:

	s.	d.	
Superintending schoolmaster - -	7	0	a day.
„ after 14 years' service as schoolmaster, five of which as superintending schoolmaster	8	0	„
Schoolmasters, on appointment - -	3	0	„
„ after 2 years' service -	3	6	„
„ „ 4 „ -	4	0	„
„ „ 6 „ -	4	6	„
„ „ 8 „ -	5	0	„
„ „ 10 „ -	5	6	„
„ „ 12 „ -	6	0	„
„ „ 14 „ -	6	6	„

The periodical increase to schoolmasters is granted on the recommendation of the Council of Military Education to those schoolmasters of whom satisfactory reports are received, both of their general conduct, and of the management and progress of their schools. Each year's service as assistant or 4th class schoolmaster under the former regulations will be allowed to reckon as six months towards the above periods.

Time spent at the Royal Military Asylum in qualifying for appointment as trained schoolmaster, whether the candidates are from civil life or from the ranks of the army, is not to reckon for the above rates of

increased pay; service from date of appointment as trained schoolmaster being alone admissible.

Pay of schoolmasters will be issued weekly by the paymaster.

Of schoolmasters.

5. Superintending schoolmasters, who on promotion to that rank were in the receipt of 8*s.* a day, will be permitted to retain that pay, but without further increase.

Half-pay and retiring allowance of superintending schoolmasters.

6. The rate of half-pay or retiring allowance for a superintending schoolmaster shall in all cases be determined by the service which he may have rendered to the public as schoolmaster, or in any former military capacity.

If a superintending schoolmaster shall have served at least 10 years as a trained or superintending schoolmaster, he shall, in case of being placed on half-pay by disability or ill health, duly certified by an Army Medical Board, to the satisfaction of the Commander-in-Chief and the Secretary of State for War, be allowed half-pay according to the following scale, viz.:—

	Per diem. *s.*	*d.*
10 years' total service and under 5 as superintending schoolmaster - - - -	3	0
Ditto and above 5 years as superintending schoolmaster - - - -	4	0
15 years' total service of which above 5 as superintending schoolmaster - - -	4	6
Ditto of which 10 as superintending schoolmaster	5	0
20 years' total service of which above 5 as superintending schoolmaster - - -	5	6
Ditto of which 10 as superintending schoolmaster	6	0
25 years' total service of which above 5 as superintending schoolmaster - - -	6	6
Ditto of which 10 as superintending schoolmaster	7	0

Every superintending schoolmaster who shall have served for an aggregate period of 30 years, of which above 5 years as a superintending schoolmaster, may, with the sanction of the Commander-in-Chief and Secretary of State for War, be permitted to retire on 7*s.* 6*d.* a day.

10 years as superintending schoolmaster with an aggregate service of 30 years - - -	8	0

In calculating the service for half-pay the whole of the period passed as a student in the training schools of the Royal Military Asylum will be excluded, but half of the service in any former military capacity will be allowed.

Pensions of schoolmasters.

7. Schoolmasters, when placed on the pension list, will be entitled to pensions according to the following scale:—

	s.	*d.*	
After 21 years' service, during the last 3 years of which he shall have been in the receipt of the highest rate of pay -	3	0	per diem.
After 21 years' service, and should he not have been uninterruptedly in receipt of the highest rate of pay during the last 3 years - - - - -	2	6	,,

The cases of schoolmasters invalided before the completion of 21 years' service will be specially considered by the Commissioners of Chelsea Hospital.

Reckoning of service.

8. In calculating the time of service for half-pay of a superintending schoolmaster, or for pension of a schoolmaster, the whole of the period passed in the training schools of the Royal Military Asylum, as well as

App. XII.

half of any former service in the army prior to his admission thereto, are to be deducted.

Candidates, and mode of admission.

9. All candidates for the appointment of army schoolmaster are required to go through a course of instruction and training in the schools of the Royal Military Asylum, Chelsea, admission to which is obtained by successful competition at examinations held periodically.

10. Serjeants, corporals, and privates in possession of one good-conduct badge, civilian pupil-teachers who have completed their apprenticeship, and certificated schoolmasters, alone are eligible to compete.

Age.

11. Candidates must be between 21 and 25 years of age at the date of examination, and they must be unmarried.

Training.

12. The period passed in education and training in the schools of the Royal Military Asylum is not to exceed two years.

First appointment.

13. On leaving the Royal Military Asylum the candidate, if qualified, will receive a certificate stating his degree of merit, and be then eligible for the appointment of army schoolmaster.

Enlistment.

14. But before receiving the appointment the candidate must enlist for a period of 10 years; or, if he is already in the army, he must be discharged, and be re-enlisted for 10 years.

15. No bounty is allowed to persons enlisting in the army for the purpose of becoming schoolmasters.

Re-engagement.

16. An army schoolmaster, after having completed his first period of service, is eligible for re-engagement for a further period of 11 years.

Applications for re-engagement.

17. Applications for the re-engagement of schoolmasters are to be made by commanding officers to the Adjutant-General, accompanied by verified copies of their records of service.

No schoolmaster is to be re-engaged without previous reference to the Adjutant-General.

Bounty.

18. No bounty is allowed on re-engagement, but the allowance in lieu of furlough and free passage granted by the 2nd paragraph of the regulations annexed to the Royal Warrant of 30th October 1861 (see Appendix) to soldiers serving at certain foreign stations, will be issued to schoolmasters on re-engagement, provided the schoolmaster is not under orders to return home; but this allowance is not admissible for those garrison schoolmasters who have availed themselves of the free passage home and back again under the conditions sanctioned by the Secretary of State for War in letters to the Military Secretary of 4th December 1861 and 16th July 1862 (see Appendix).

Furlough on re-engagement.

19. Furlough on re-engagement will be granted to schoolmasters at home stations, and at those foreign stations specified in par. 1 of the regulations attached to the Royal Warrant of 30th October 1861, but special application must be made to the Adjutant-General, in order that it may be granted at such time as may be least inconvenient to the school.

Quarters, fuel, and light.

20. A superintending schoolmaster, where no special quarters are provided, is entitled to lodging allowance, including fuel and light, at the staff rate sanctioned for subaltern officers.

21. Where special quarters are provided he is entitled to furniture for two rooms and an allowance of fuel and light at the staff rate sanctioned for subaltern officers.

22. A schoolmaster, where no special quarters are provided, is entitled to a staff serjeant's room, with fuel, light, and furniture for the same; a separate kitchen, or part of a kitchen, is also to be allowed him whenever it can be so arranged.

23. If married with leave, and his wife be with him, he is entitled to a staff serjeant's room and one additional room (when it can be provided) with furniture for the two rooms, and with an allowance of fuel and

light equal to one and a half times that sanctioned for 1st class staff serjeants by Circular 767.

24. At home stations, when neither special quarters nor barrack-rooms are provided, he is entitled to lodging money (including fuel and light) at the rate applicable to 1st class serjeants.

25. At foreign stations he is entitled to the allowance applicable to his class for one room, and if married, to an additional half-room's allowance.

Travelling allowance.

26. Superintending schoolmasters, when travelling on duty, are entitled to the same travelling expenses and personal allowance as officers of corresponding rank.

27. Schoolmasters, when moving with troops, are entitled to marching allowance at the rate of 2*s.* 6*d.* per day, on the same conditions that entitle troops to marching allowance.

Detention allowance.

28. Schoolmasters necessarily detained when proceeding to the regiments or garrisons to which they have been appointed are granted detention allowance at the rate of 3*s.* 6*d.* a day, the causes of detention being satisfactorily explained and duly certified.

Personal allowance.

29. They are to be granted the same rate of personal allowance of 3*s.* 6*d.* a day while travelling (excepting for the days they may be victualled on board steam or other ships under Government contract); and when joining their regiments, or when visiting detachment schools, they are, in addition to the above personal allowance, to be reimbursed the actual and necessary expenses of travelling by railway or steam-boats as second-class passengers, or by any other conveyance as ordinary passengers.

30. For the first and last days of the journey, and when the schoolmaster goes from and returns to his quarters the same day, the allowance is to be half the above daily rates, provided in the latter case that he shall have been necessarily absent from his quarters or fixed place of residence for a period exceeding 10 hours.

31. When the schoolmaster is removed from one station to another, and the journey can be completed the same day (the distance not being less than 10 miles), half the daily rate is to be allowed.

32. A schoolmaster transferred from one station to another without troops will be allowed the actual expense for conveyance of his wife (not being a schoolmistress), providing the cost does not exceed 1*d.* a mile.

Passage of schoolmaster's wife and family.

33. When a schoolmaster is ordered to proceed to or from a foreign station without troops, he, with his wife and family, is entitled to an intermediate or second-class passage at the public expense; and when proceeding with troops, to suitable berths, under such arrangements as the Lords of Admiralty may from time to time sanction. When so accommodated, and when provisioned on board, he is subject to deduction for rations at the rate of 1*s.* per diem for himself, 4*d.* a day for his wife, and 2*d.* a day for each child. Where circumstances do not permit of such special accommodation he is subject only to the usual deduction of 6*d.* per diem for rations.

Free rations abroad.

34. Free rations are allowed to the wives and families of trained schoolmasters married with leave and serving abroad.

Baggage.

35. Schoolmasters when moving with troops are entitled to conveyance of 3 cwt. of baggage, the cost to be defrayed by an addition to the regimental rate of 1½*d.* per mile for each schoolmaster; when transferred from one station to another by land, they are entitled to charge for the weight of baggage specified in the following schedule.

App. XII.

SCHEDULE of the WEIGHTS of BAGGAGE allowed to be conveyed at the Public Expense by Land. Charges to be supported by Voucher, showing the actual Quantities and Rates per Cwt. by Goods Train.

	Limit of Weight allowed.	To be so packed as not to exceed in Measurement.
	cwt.	cubic ft.
Married schoolmaster when travelling without troops, if accompanied by his wife	10	50
Ditto ditto if not so accompanied	6	30
Unmarried schoolmaster when travelling without troops	4	20

When travelling by sea the same weight of baggage will be allowed.

Note.—These quantities to include professional books. School materials will be conveyed as regimental baggage.

Clothing. 36. Schoolmasters are to be provided with clothing in conformity with the regulations which may from time to time be in force, and according to approved patterns, which are not to be deviated from. They are on no account to appear out of uniform.

Salute. 37. They are to salute officers whom they know to be such, whether dressed in uniform or not.

Marriage. 38. Applications for permission to marry are to be accompanied by the opinion of the commanding officer as to the character and respectability of the person to whom the schoolmaster is desirous of being married.

Upon foreign stations the application is, in like manner, to be forwarded to the general or other officer commanding, who, if he thinks proper, will sanction the marriage, reporting the same to the adjutant-general.

Private tuition. 39. Schoolmasters are prohibited from engaging in private tuition.

Attestation of schoolmaster. 40. On the appointment of a trained schoolmaster to a regiment, a certified copy of his attestation is to be transmitted to the officer commanding the depôt of such regiment, and his service in the regiment is to be recorded on the third page, dispensing with the usual regimental number.

Attestation on transfer. 41. On the transfer of a schoolmaster to another regiment, the copy of his attestation, with the record completed to the date of transfer, is to be transmitted to the officer commanding the depôt of the regiment.

Medical treatment. 42. Schoolmasters requiring medical treatment are to receive it at their own quarters, going into hospital only when the nature of the complaint renders it necessary. They are to be subjected when in hospital to the usual rate of stoppage for non-commissioned officers or soldiers; but when attended in their own quarters, and receiving medicine only from the hospital, they are not to be subject to such stoppage.

Misconduct. 43. When a schoolmaster is placed in arrest, the facts and circumstances of the case are to be reported to the adjutant-general for the information of the Commander-in-Chief. If abroad, the general officer commanding on the spot is to give such orders on the subject as he may think fit, reporting the particulars of the whole case to the adjutant-general; but no punishment awarded by a court martial is to be carried into effect until the proceedings have been submitted to the Commander-in-Chief, except in the East Indies, St. Helena, the Cape of Good Hope, and stations to the eastward of it.

Communications from schoolmaster.

44. All official communications from the schoolmaster are to be made to his commanding officer, who will report thereon, should he deem it necessary to refer them to the adjutant-general. Written communications, however, from the schoolmaster to the commanding officer are, as much as possible, to be avoided.

Servants and school orderlies.

45. A permanent orderly is to be told off to keep the schoolroom and schoolmaster's quarters clean, and to prepare, if necessary, the schoolmaster's meals. The orderly is to receive for this duty one shilling a week.

Superintending schoolmasters will receive an allowance of 1*s.* day in lieu of a servant.

Soldiers to be trained for acting and detachment schoolmasters.

46. With a view to provide a qualified soldier to act in case of need as schoolmaster to the regiment or any detachment, the schoolmaster is to train, in anticipation, one or more men of the regiment in such manner as to secure at least one man competent and available for this duty. The number of men competent to take charge of a detachment school is to be stated in the monthly school report.

Acting schoolmasters.

47. Acting schoolmasters appointed to regiments by the authority of the Commander-in-Chief, in the absence of trained schoolmasters, are allowed, in addition to their regimental pay, 1*s.* a day when the number of adults attending school does not exceed 50; 1*s.* 3*d.* a day when the number is over 50 and does not exceed 100; and 1*s.* 6*d.* a day when the number exceeds 100.

Acting schoolmasters for the Royal Artillery and Royal Engineer will be paid at the following rates:—

	s.	
At stations where there is one battery or company - -	0	6
At stations where there are more than one, and not more than three batteries or companies - - -	1	0
At stations where there are more than three batteries or companies - - - - - - - -	1	6

No special allowances of quarters, fuel, or light will be given to acting schoolmasters.

Detachment schoolmaster.

48. Whenever it is considered necessary to establish detachment schools, 6*d.* a day will be allowed for a master for each school; but previously to the formation of such schools application must be made to adjutant-general, accompanied by a statement of the number of adults and children requiring instruction, and the name of the non-commissioned officer recommended for appointment.

At foreign stations the application must be made to the general or other officer commanding, who is authorized to sanction the same, subject to the approval of the Commander-in-Chief.

Schools on board ship.

49. Whenever a trained schoolmaster or schoolmistress embarks with troops for long voyages, the commanding officer will make the best arrangements in his power for opening a school for adults and children, for which purpose a supply of school materials should be provided. Should there be no trained schoolmaster or schoolmistress on board, the commanding officer may select any qualified non-commissioned officer to act as schoolmaster, to whom 6*d.* a day will be allowed from the date of embarkation. Should there be young children enough for a separate school, an acting schoolmistress may be appointed at the same rate.

Soldier assistants, rate of allowance to and number allowed.

50. An allowance of 3*d.* a day is to be paid to such number of soldiers, selected by the commanding officer to assist the schoolmaster, as may be found necessary, under the following restrictions:—

App. XII.

51. When a trained schoolmaster is attached as assistant to the regiment or garrison,

One soldier assistant when the numbers of adults and grown children attending the school reach	-	120
Two ditto	-	180
Three ditto	-	230

And one additional for every additional 50 men.

When there is no trained assistant,

One soldier assistant when the numbers reach	-	60
Two ditto	-	100
Three ditto	-	140

And one additional soldier assistant for every additional 40 men.

52. The charge for these allowances in the pay list is to be supported by a certificate from the commanding officer of the number of adults actually attending the school during the quarter, showing whether one or more trained assistants are attached to the garrison or regiment, and by the receipts of the men for whom the charge is made.

Sunday duties.

53. The provisions of the Queen's regulations and orders for the army with respect to attendance at Divine Service fully apply to army schoolmasters.

54. Sunday schools are left to the management and direction of the chaplains to the forces; but army schoolmasters are required to attend and assist the chaplain of the religious denomination to which they themselves belong, as well as to encourage the attendance of all the children under their instruction at their respective Sunday schools, with a view to the more specific religious teaching which cannot be conveniently given in the weekly school attendance.

55. Schoolmasters are to accompany the school children of their own religious persuasion to church or other place of worship, and to endeavour on all occasions to promote their religious welfare. Should there be no children of their own religious persuasion, schoolmasters are to fall in in rear of the troops, and accompany those of their own persuasion to church or other place of worship.

56. They are not to be required to attend at any form of Divine Worship to which they entertain conscientious objections. The religious denomination of schoolmasters is to be noted on their records of service, and any change is to be immediately reported to the adjutant-general.

Weekly duties.

57. Under ordinary circumstances a school day is to comprise *six and a half hours' actual attendance* in the forenoon, afternoon, or evening. The hours during which the school is open daily are to be stated in the Monthly Report.

58. The school is to be closed on Saturday afternoon.

SCHOOLMISTRESSES.

59. Schoolmistresses are of three classes; their first appointment is to the third class, and they are afterwards promoted by the Council of Military Education according to their merit and services.

Pay.

60. Their pay is as follows:—

1st class schoolmistress	36*l.*	per annum.
2nd do.	30*l.*	„
3rd do.	24*l.*	„

Pension.

61. Trained schoolmistresses may be granted under certain circumstances of long service a retiring pension under the following conditions:—

After 12 years' service, from 9*d.* to 1*s.* a day, according to the responsibility and extent of their duty, with an increase of 1*d.* for every additional year of service up to 24 years, whereby a maximum of 2*s.* may be obtained.

62. It is to be understood, however, that no schoolmistress shall have an unqualified claim to a pension until she has actually served for a period of 21 years; and although intermediate rates are laid down for shorter periods, they will only be granted where failing health disqualifies the schoolmistress for further service; this must be satisfactorily established by a medical board, with a view to the application being specially considered by the Commander-in-Chief and Secretary of State for War.

Intermediate periods of non-employment will not be allowed to count.

Quarters, fuel, and light.

63. Schoolmistresses, being wives of trained schoolmasters, have no separate claim for fuel, light, or quarters.

64. All other schoolmistresses are entitled to quarters, with one room's fuel and light, or to the combined allowance in lieu thereof, provided that, if married, their husbands are not already, by virtue of some staff situation, in receipt of quarters, fuel, and light.

65. In cases where the husband is in receipt of a less amount than one room's allowance, it may be made up to that amount.

66. Unmarried schoolmistresses, or schoolmistresses whose husbands are on service at another station, are not to be required to reside within the barracks; they will be entitled to the commuted allowance in lieu of quarters, fuel, and light, chargeable quarterly on War Office Form 1097, the commanding officer certifying that the claimant was actually present, and doing duty, and that she was, during the period claimed, a spinster or widow, or separated from her husband by the service, as the case may be; the barrack master certifying that she was not provided with accommodation or fuel or light in kind. Lodging money also is admissible during the authorized vacations, when such schoolmistresses are certified not to have been provided as above.

Marching allowance.

67. Schoolmistresses not being wives of trained schoolmasters, or, if wives of trained schoolmasters, not travelling with their husbands, are entitled, when moving with troops, to marching allowance at the rate of 2*s.* 6*d.* a day; and when transferred from one station to another, and not moving with troops, to a personal allowance of 3*s.* 6*d.* a day according to the rules by which these allowances are granted to schoolmasters.

68. Half these rates of marching and personal allowance are granted to schoolmistresses, being the wives of trained schoolmasters, and travelling with their husbands.

Baggage.

69. Schoolmistresses when moving with troops are entitled to conveyance of 3 cwt. of baggage, the cost to be defrayed by an addition to the regimental rate of 1½*d.* per mile for each schoolmistress; when transferred from one station to another by land, they will be allowed to charge for the weight of baggage specified in the following schedule.

	Limit of Weight allowed.	To be so packed as not to exceed in Measurement.
	cwt.	cubic ft.
Unmarried schoolmistresses - - - -	4	20
Married schoolmistresses whose husbands are not trained schoolmasters - - - - - -	6	30
Schoolmistresses, being the wives of trained schoolmasters, *but not travelling with them*, or whose allowance is not included in that of their husbands - - -	6	30

When travelling by sea they will be allowed the same weight of baggage.

App. XII.

70. Trained schoolmistresses, widows or unmarried, when proceeding to or from a foreign station without troops, will be entitled to an intermediate or second-class passage; and when proceeding with troops to a suitable separate berth, subject to a deduction of 4*d.* a day for rations when provisioned at the public expense; and in the case of widows, to second-class passages for their children, subject to a deduction of 2*d.* a day for each child for rations.

First appointment.

71. Persons between the ages of 21 and 30 years, holding certificates of proficiency under the Committee of Council on Education, are eligible for the appointment of third-class army schoolmistress, without further examination.

72. Persons between the ages of 21 and 30 years who have been employed as teachers in army schools, and who can pass a satisfactory examination in the undermentioned subjects, are eligible to be sent to one of the institutions named in the margin, there to be trained at the public expense in the art of teaching.

London { 1. Home and Colonial Training Institution. 2. Wesleyan Training Institution.
Dublin—National Society Training Institution.
Edinburgh—National Training Institution.
Glasgow—Free Church Training Institution.

Reading.
Writing in large, round, and small hand.
Writing from dictation.
Outlines of English Grammar.
The first four rules of arithmetic, simple and compound, reduction, proportion, and practice.
Sacred history.
English history and geography.
General geography, viz., the continents, the principal states, chief cities, principal mountains, lakes, rivers, oceans, and seas.
Needlework,—cutting out and making children's dresses, knitting, marking, and darning.

If a candidate has a taste and an ear for music, and can sing, it is regarded as an important qualification.

Training.

73. The period of training at the Home and Colonial Training Institution is one year for unmarried, and six months for married women and widows; at the other institutions the period is six months for all.

On being reported qualified they are eligible for appointments as third-class army schoolmistresses.

Pupil-teachers.

74. Young women between the ages of 17 and 21 are appointed by the Council of Military Education as pupil-teachers, to assist in the management of infant and industrial schools; their pay is as follows:—

1st year	-	6*l.* per annum.
2nd „	-	9*l.* „
3rd „	-	12*l.* „
4th „	-	15*l.* „
5th „ and afterwards	-	18*l.* „

Assistant schoolmistresses.

75. Wives of non-commissioned officers are appointed assistant schoolmistresses by the Council of Military Education.

Pay.

76. The pay of assistant schoolmistresses is the same as that of pupil-teachers.

77. The assistant schoolmistresses and pupil-teachers, if of the required age, are eligible for admission to training institutions; but if considered by the Council of Military Education to be equal to trained schoolmistresses in regard to education and skill in teaching, they may be appointed to the third-class of army schoolmistresses without further training.

78. One pupil-teacher or one assistant schoolmistress may be appointed by the Council of Military Education to assist in the infant and industrial schools of regiments, cavalry depôts, depôt battalions, and garrisons, whenever the number of children attending these schools exceeds 50. Number of teachers allowed to schools.

79. When a trained schoolmistress is not available for appointment to a regiment, an acting schoolmistress will be temporarily appointed by the Council of Military Education, with pay at the rate of 18*l.* per annum, without other allowances. Acting schoolmistresses.

80. Schoolmistresses may also be appointed to detachments, at the discretion of the Council of Military Education, with pay varying from 10*l.* to 18*l.* per annum, without other allowances, according to the number of children requiring instruction, provided that the latter cannot attend any regimental or garrison school. Detachment schoolmistresses.

81. Girls of 13 years of age, who have been educated in army schools, are eligible as monitresses; but they are not allowed to fill the situation after attaining the age of 17 years. Monitresses.

82. Their pay is 4*l.* per annum. Pay.

83. They are appointed by the Council of Military Education when the number of children attending the Infant and Industrial Schools exceeds 25; and for every additional 25 another additional monitress may be appointed, except where an assistant schoolmistress or pupil-teacher is appointed.

84. They are to be taught by the schoolmaster an hour and a half daily with the other children; and the schoolmistress is to require that they practise sewing at home in the evening.

85. Special reports upon the qualifications of the assistant schoolmistresses, pupil-teachers, and monitresses (addressed to the Council of Military Education) are to be made by the assistant and local inspectors, and by superintending schoolmasters, after each inspection of the schools.

86. Schoolmistresses wishing to marry must apply for permission, through their commanding officer, to the Council of Military Education. Marriage.

87. The ordinary leave of absence to be granted to schoolmistresses, without forfeiture of pay, is not to exceed six weeks in one year, including the summer and winter holidays. The claims of those on foreign stations who may have leave to return to England will be specially considered. Leave of absence.

88. In the event of illness, duly certified by an army medical officer, a schoolmistress serving at home may be granted leave of absence from her duties for three months in any one year without forfeiting her pay, application being made in accordance with Article 139; but should her state of health render further absence necessary, she is to be placed on the list of unemployed schoolmistresses, from which date her pay will cease. The cases of schoolmistresses serving abroad will be specially considered. Sick leave.

89. When a schoolmistress is placed on the "unemployed list," her vacancy is to be immediately filled up; but should she return to duty within the period of two years, she is to be considered as a supernumerary until a vacancy occurs, when she is to be placed on the list in the same position that she held prior to her being unemployed. Unemployed list.

90. The appointment of an acting schoolmistress will be considered by the Secretary of State whenever a schoolmistress shall be absent from her duties for a longer period than six weeks.

91. Schoolmistresses, who, in consequence of marrying or of any other causes, may decline to be transferred to stations where their services are required, will be placed on the unemployed list, their pay being stopped when their services cease to be given.

92. Any schoolmistress who may remain unemployed for a period of

App. XII.

two years is to be removed altogether from the list of army schoolmistresses, and to lose all claim for further employment.

Sunday duties.

93. The Sunday duties of schoolmistresses are similar to those laid down (pars. 54 to 56) for schoolmasters.

Schools.

Prayers.

94. The school is to be opened by the master at 9 a.m. with the Lord's Prayer, with or without the addition of one or more collects from the Book of Common Prayer, or with one of the forms of prayer which may be expressly authorized for this purpose.

Bible lesson.

95. He is to proceed to give a collective Bible lesson, or to read and explain a short passage of Holy Scripture taken from the authorized, or the Douay version.

96. Schoolmasters, if Protestants, are to follow the directions of the chaplain of the forces as to the course of Bible lessons to be given during each week.

97. The attendance of adults at this instruction is to be entirely voluntary.

General opening

98. The parents of children who are not of the same religious persuasion as the schoolmaster are to be at liberty to send their children to school at the hour for commencing general instruction, viz., 9.30 a.m., and not at the hour for opening school, so that there may be no impediment to religious instruction being extended to such adults and children as are desirous of receiving it.

99. The hours for opening and closing the schools abroad will be fixed by the officer commanding at the station, with reference to the climate, and provided the spirit of the regulations be maintained.

100. The same principle is to apply to infant schools.

Religious instruction.

101. On two days in each week, of which Saturday is not to be one, an hour is to be set apart for specific religious instruction, under clerical direction, viz., from 9 to 10 a.m. or from 11 a.m. to 12, as the commanding officer may order, when the officiating chaplains to the forces, the Roman Catholic clergy, and the ministers of any denomination belonging to places of worship to which the troops are marched on Sunday, are to be at liberty to attend and to form separate classes of adults or children of their own respective persuasions, on a general notice given previously to the commanding officer of the regiment or station, who will direct on what days and in what places their respective classes shall be assembled. The schoolmasters, schoolmistresses, pupil-teachers, and monitresses are invariably to attend, and they are to assist the clergymen of their respective persuasions.

102. The time for religious instruction abroad will be fixed by the officer commanding the troops at the station at the first or last hour of the morning attendance.

103. No secular instruction, whether literary or industrial, is to be carried on in the same room during its employment for the purpose of religious instruction; and no religious instruction is to be given by the chaplain or other clergyman, except on Sundays, and at the times fixed by the commanding officer of the station, in conformity with the foregoing regulations.

Terms of admission to army schools.

104. All non-commissioned officers, drummers, and privates are admitted gratuitously.

105. The children of non-commissioned officers and soldiers are admitted at the following rates of payment:—

1. Twopence per month for one child only.
2. Three halfpence per month for each child if two of the same family attend.
3. One penny per month for each child if three or more children of the same family attend.

106. The children of all soldiers serving abroad who have been precluded from accompanying their fathers are to be admitted gratuitously.

107. The children of barrack serjeants, of warders and servants of military prisons, of deceased soldiers, and of Militia staff, of pensioners or discharged soldiers in regimental or garrison employment at the station where a school is established, may attend on payment of the same fees as are charged for the children of non-commissioned officers and men.

108. Children of pensioners not in regimental or garrison employment at the garrison or station, of coast guardsmen, of canteen-keepers, of contractors' foremen and labourers, of officers' private servants, and of others employed in the garrison or on duties connected therewith, may, at the discretion of the commanding officer, be admitted to the schools on payment of 3*d*. a week for each child.

109. Children of persons not connected with the army, nor employed as in the preceding article, are only to be admitted in special cases, with the approval of the Commander-in-Chief, obtained through the Council of Military Education, and on payment of 5*s*. a month for each child.

110. The children of regimental or garrison officers may attend the schools, and join the classes with the other children, paying the following rates; but no distinction is to be made between these children and the others attending the school:—

	s.	*d.*	
One child - - - -	5	0	per month.
Two children of the same family -	7	6	„
Three „ „ -	10	0	„
Four „ „ -	12	6	„

111. All fees are to be credited to the public, and to be shown in the monthly return. Any part of a month is to be paid for as a whole month, and any part of a week as a whole week; and those only who have attended during the month are to appear in the monthly school report as on the school books for that month, and in the return of payments rendered quarterly to the paymaster on War Office Form No. 369.

Register of attendance.

112. The schoolmaster is to keep a register of all persons attending the adult and grown children's schools, together with a daily register of attendance, which he is to submit weekly, or oftener, if necessary, to the commanding officer's inspection.

Nominal return of payments.

113. The schoolmaster is to submit to the commanding officer monthly nominal returns, in duplicate, of the children of the corps under his command attending the school, showing the sum to be paid for each; the duplicate return to be transmitted (if approved by the commanding officer) to the paymaster, in order that he may make the necessary charges in the accounts of the troops or companies to which they respectively belong.

114. Should there be children belonging to any other corps attending the school, the schoolmaster is in like manner to forward to the commanding officer of that corps a return, in duplicate, approved by his commanding officer, showing their names and the charge against each on account of school instruction; furnishing at the same time to the paymaster of his own corps a memorandum of the gross amount so charged. The amount is to be handed over to the paymaster of the corps to which the schoolmaster is attached, and by him credited to the public.

Collection of the fees.

115. The schoolmaster is to receive the fees payable for the grown children; and the schoolmistress is to receive those payable for the infant children of persons who have special permission to send them to army schools. These fees are to be collected monthly, in advance, from those who pay at a monthly rate; and weekly, in advance, from those

App. XII.

who pay at a weekly rate. The schoolmistress is to hand over the money thus received to the schoolmaster, and to take a receipt for the same. The schoolmaster is to submit a return, in duplicate, to the commanding officer, showing the names of all such children attending school, the rank or situation of the parents, and the sum received in advance on account of each child. The duplicate return to be transmitted (when approved) to the paymaster, who will then receive from the schoolmaster the sum stated, and credit the same to the public.

116. In the case of non-regimental schools, the schoolmaster is to observe the same rules as above; and the sums are to be received and credited to the public by such local paymaster as the officer commanding at the station or the Secretary of State for War may direct.

Quarterly return of payments.

117. On the 31st March, 30th June, 30th September, and 31st December in each year the schoolmaster is to submit to his commanding officer a quarterly return, in duplicate, on War Office Form No. 369, showing the amount which has been received and credited to the public, and stating the number of children who have attended the schools during the quarter, taking care not to include the same individual more than once. These returns are to be certified by the commanding officer; one of them is to be delivered to the paymaster, and the other is to be forwarded to the Council of Military Education for transmission to the Secretary of State for War.

Monthly report.

118. On the first of each month the schoolmaster is to submit, in duplicate, to his commanding officer a report, on War Office Form 367, filling up the column of remarks with such observations as he may deem necessary. This report is to be countersigned by the commanding officer, who will transmit one copy to the Assistant Inspector of Army Schools in the district, the other to the Council of Military Education, with any remarks that he may have to make, according to the directions contained on the fourth page of the report.

Half-yearly report.

119. The schoolmaster is also to prepare a half-yearly return of education, on War Office Form No. 370, which is to be forwarded in duplicate by the commading officer to the adjutant-general on the 31st March and 30th September.

School accommodation.

120. Should the schoolroom not afford means of effectively carrying out the prescribed system of instruction, the commanding officer is to represent the same to the officer commanding at the station or garrison, giving full particulars of the dimensions of the school, the defects thereof, and the manner in which they may be remedied, in order that the same may be reported to the quartermaster-general.

Fuel and light for the school.

121. If, in consequence of the number of men attending the school, the supply of fuel and light be insufficient, a representation to this effect is to be made by the commanding officer, through the proper channel, to the quartermaster-general, stating the dimensions of the schoolroom, the number of men attending, the quantity of coals and candles or lamps supplied, the number of lights the latter afford, and the increased quantity which it is deemed absolutely necessary, and whether means exist for supplying the school with gas.

Where moderator or other lamps are required, special application for the same is to be made to the quartermaster-general.

Books, &c., supply of.

122. Such books and materials as may be required for the use of schools (except for regiments in India), and small quantities of stationery for the use of the schoolmaster, will be supplied upon transmission of a requisition in duplicate on War Office Forms 372 and 760 to the Council of Military Education. These requisitions should be carefully prepared. (*See* Appendix Circular 760).

No books or materials will be supplied that are not applied for in the precise terms by which they are designated in the authorized list.

123. Blank forms for the use of the school are to be separately applied for by the commanding officer in his periodical requisition on the War Office Forms Nos. 406 and 407. Blank forms.

124. Commanding officers are to exercise such control over the expenditure as will prevent any unnecessary waste, loss, or damage. They are to hold the schoolmaster accountable for the same, and to require any person through whose wilfulness or neglect school property may have become damaged, lost, or destroyed to pay for the same, the amount being recovered by the paymaster from non-commissioned officers and men, and by such means as the commanding officer may direct from the parents of children not belonging to the regiment or battalion. On default of payment, the children are to be removed from the school. Care of school property.

125. On all occasions of a schoolmaster being relieved, the commanding officer is to cause a board of officers to inspect the whole of the school books and material in charge, comparing the same with an inventory prepared and signed by the schoolmaster, which inventory is to be delivered with the school property to the schoolmaster who succeeds. Similar arrangements are to be made on the relief of a schoolmistress. Transfer of school property.

126. Quarterly returns, on War Office Form 403, are to be transmitted, in duplicate, by the paymaster to the War Office, through the Council of Military Education, showing the estimated cost of any repairs required to the school property, as well as the amount which has been received and credited to the public on account of wilful damages. Repairs.

127. Any expense incurred for the conveyance of school property, not being personal baggage, from one station to another, is to be defrayed out of the commuted rates granted by the War Office Regulations for the carriage of regimental baggage. Black-boards and easels, ink-stands, maps, slates, are to remain at the station, and not be moved with regiments or corps. Conveyance.

128. Should a commanding officer consider it desirable that the schoolmaster should visit a detachment school, application is to be made to the adjutant-general, accompanied by a statement of the grounds on which such visit is recommended. Inspection of detachment schools.

129. In every regiment and depôt battalion an infant school is to be established, of which the schoolmistress is to have sole charge, for the purpose of affording instruction to the younger children of both sexes. Infant schools.

130. The rules laid down for the opening of the adult and grown children's schools at 9 a.m. with prayer and a Bible lesson are to be observed in regard to the infant schools, the schoolmistress here performing similar duties to those laid down for the schoolmaster, *see* paras. 94, &c. Opening school, prayers, and Bible lesson.

131. Children attending the infant school are to receive general instruction in a room apart from the ordinary schoolroom from 9.30 to 12 o'clock every morning, until they are able to read words of two syllables at least; but no boys will be allowed to remain in the infant school after attaining the age of eight years. Hours of attendance.

132. A school of industrial occupation, under charge of the schoolmistress, is to be held in the infant schoolroom between the hours of 2 and 4 p.m. daily. In this school the elder girls and the children belonging to the infant school are to be instructed in knitting, darning, sewing, and needlework generally. Industrial schools.

133. For the encouragement and in aid of the expenses of industrial schools, a capitation grant of 5*s.* per annum on each pupil is made on submission of a requisition, War Office Form 1,050. The money thus obtained is to be laid out in the purchase of materials; and the articles made up (which are not to include any fancy-work) are to be distributed,

App. XII.

under the authority of the commanding officer, and in such proportion as he may deem proper, as rewards for good conduct and skill amongst the children, at the commencement of the summer and winter vacations.

The amount applied for is to be calculated upon the average number of children who attended the industrial school during the preceding year.

134. The requisition is to contain a statement of the amount of the pecuniary grant last received, of the articles made up from its provision, and of the mode in which those articles were disposed of; it is to be signed by the schoolmistress and schoolmaster, and when approved and signed by the commanding officer, is to be forwarded to the Council of Military Education in sufficient time for the grant to be received on the 1st April in each year.

Should the requisition be approved, the paymaster will be authorized to charge the expense to the public, on being furnished with receipted bills for the amount.

Admission and fees.

135. It is not intended that all material used or made up by the children under the instruction of the schoolmistress shall be supplied by the public; it is the duty of the schoolmistress to encourage the children to bring material of their own to the schools, and to direct and assist them in cutting out and making up articles of clothing for themselves or their parents. One attendance in the week is to be devoted to darning and otherwise mending clothes.

Register of attendance.

136. The rules laid down for admission and for fees are the same as those for the grown children's schools; but payment for one school admits to both. These fees, as well as those for children specially permitted to attend, are to be collected by the schoolmistress, and to be made over by her to the schoolmaster, who is to give a receipt for the same.

137. The schoolmistress is to keep a register of all the children attending the school, together with a daily register of attendance, which she is to submit weekly, or oftener, if necessary, for the commanding officer's inspection.

Inspection by schoolmaster.

138. The schoolmaster is to examine the infant school, when required to do so by the commanding officer, to whom he will, after his examination, report thereon; but he is not to exercise any control or authority over the schoolmistress and her assistants.

Miscellaneous.

Holidays and leave of absence.

139. The schools are to be closed for three weeks, from about the 20th June and 20th December in each year, for the summer and winter holidays; during these periods commanding officers may grant leave of absence to the schoolmasters, schoolmistresses, and their assistants; but at no other time is leave to be granted to the schoolmaster or schoolmistress, except on urgent grounds, and then only with the sanction of the Commander-in-Chief, if at home, or of the general or other officer commanding, if abroad.

140. The monthly reports for June and December are to be made up to the date on which the holidays commence.

Inspection.

141. The assistant and local inspectors of schools will make a minute inspection of each school at least once in each year. They are to give due notice to the commanding officer of their intended visit, and to furnish him with an abstract of their report to the Council of Military Education on the result of the inspection. The Commander-in-Chief requires commanding officers and others to afford the inspectors every facility for the complete performance of this duty.

Correspondence.

142. All recommendations for the training of soldiers at the schools of the Royal Military Asylum at Chelsea, and all communications relating to the promotion, transfer, furloughs, and discharge of trained schoolmasters, and, generally, all questions affecting their discipline, are to be

addressed to the Adjutant-General of the Forces, who will, after conferring with the Council of Military Education, notify the Commander-in-Chief's orders thereon. App. XII.

143. Correspondence regarding the school regulations, the periodical returns and reports of the schools, the appointment, the training, &c. of schoolmistresses, the supply of apparatus for the illustration of lectures for the entertainment and instruction of the troops, are to be addressed to the Secretary to the Council of Military Education.

APPENDIX.

Circular No. 760.

HOME AND FOREIGN.

War Office,
27*th May* 1862.

The enclosed form of requisition for school books, stationery, and materials, showing the price of the articles included therein, is furnished for the information and guidance of commanding officers and schoolmasters of garrison and regimental schools, and with a special view to enable commanding officers, when considering or confirming requisitions, to ascertain that due regard has been paid to economy, both in the general management of the schools and in framing the demands for supplies. Stationery, War Office. 218

The requisitions, after being considered and signed, should be transmitted, in the first instance, direct to the Council of Military Education, 13, Great George Street, Westminster, S.W., instead of to the War Office, as heretofore.

Secretary Sir George C. Lewis has, in concurrence with His Royal Highness the General Commanding-in-Chief, fully approved the form, and requests that the object for which it has been framed may be specially borne in mind when requisitions for supplies are made.

Edward Lugard.

Circular No. 367. (*Clothing.*)

War Office,
24*th December* 1858.

The following Regulations with regard to the Supply of Clothing to Trained Army Schoolmasters will come into force on 1st April 1859. 51 Schoolmasters. 1296

1. The clothing for the year 1860, and for the future, will not be supplied made up, but in materials.

2. Every trained army schoolmaster will, for the future, make an annual demand, upon the authorized size roll, for his clothing; from stations east of the Cape of Good Hope in April, from all other stations in June. He will, at the same time, ascertain and report whether the military storekeeper has a set on hand, when it was received, and for whom intended.

3. Should a schoolmaster serving abroad leave the command before the receipt of the materials, he will immediately report the circumstance to the director of stores and clothing; and, if not already despatched, they will be forwarded to the station to which he is transferred; should they have been despatched, they will, on arrival, be received by the military storekeeper and taken on charge, but not sent after him, and another set will be despatched from England.

4. Should it appear, on the receipt of a requisition in advance, that there is a suit of clothing in store at the station, its issue to the applicant, at the proper time, will be authorized, less any badges to which his rank may not entitle him.

5. All materials will become due on 1st March, in order that the clothing may be made up and taken into wear on the 1st April, at whatever time the schoolmaster may have quitted the Royal Military Asylum; those, however, who quit the Royal Military Asylum at Midsummer will receive a compen-

App. XII.

sation the first year in lieu of a suit, which will not be issued until the following March.

6. Schoolmasters on home stations, if ordered to the Cape of Good Hope, or stations eastward of the Cape of Good Hope, after 1st July, will take their next year's materials with them.

7. Schoolmasters ordered to any other Foreign Stations after 1st January will take their next year's materials with them.

8. Schoolmasters on home stations, by the monthly school reports of February, will receive their clothing materials direct in the course of March.

9. An uniform sum of 13*s.* will be allowed for making up each suit, in strict conformity with regulations, viz., 10*s.* for tunic, and 3*s.* for trousers.

A further sum of 10*s.* will be allowed in compensation for one pair of boots.

A receipt for these two sums signed by the tradesman and by the schoolmaster, and attached to the paymaster's account, will be a sufficient voucher.

10. All silk sashes will be expected for the future to last four years.

11. Deviation from the authorized pattern, by the addition of gold lace round the collar, or otherwise, is strictly forbidden ; but for the future the tunic will bear the badges of rank on both sides of the collar.

B. Hawes.

The following Warrant and Regulations are to be substituted for those previously issued of the same number and date, which are hereby cancelled.

Circular No. 722.

HOME AND FOREIGN.

VICTORIA R.

27 Gen. No. 1312

Whereas it has been represented to Us that it is expedient to cancel that part of the 27th Clause of the Pension Regulations in Our Royal Warrant of the 1st July 1848, which prescribes the conditions under which a discharged limited service soldier shall be permitted, on re-enlistment, to reckon his former service: Our will and pleasure is, that instead of the before-mentioned conditions, which are hereby cancelled, any soldier who has been, or shall hereafter be, enlisted for limited service, and shall hereafter be discharged before or after the expiration of the first period of service, and shall be permitted to re-engage or again enlist within 12 months from the date of his discharge, shall be allowed, under Clauses 4 and 5 of the regulations and restrictions hereunto annexed, or such others as shall from time to time be established by Our Secretary of State for War and the General Commanding-in-Chief of Our army, to reckon half the period of his former service towards his future claim to pension.

Given at Our Court at St. James', this thirtieth day of October 1861, in the twenty-fifth year of our reign.

By Her Majesty's command,

G. C. Lewis.

Regulations to be annexed to the Royal Warrant of 30th October 1861, Circular No. 722.

27 Gen. No. 1312

1. With a view to give full effect to the provisions of the Limited Enlistment Act, and at the same time to hold out every encouragement to time-expired soldiers of good character to continue in the service, it is hereby notified that, in addition to the privilege of being permitted, on re-engagement, to count the full period of their first term of service towards increase of good-conduct pay, and to pension on discharge, and of receiving a fresh bounty, as well as the regulated allowance in lieu of a free kit, and an allowance of 1*s.* a day for 20 days, men who re-engage at the head-quarters of their regiment for a second term of service will be granted a furlough, if serving at home, for a period of two months, commencing from the date of re-engagement ; and, if serving at either of the stations named in the margin, will be provided with a free passage to this country at a convenient opportunity, at the discretion of

Gibraltar, Malta, Ionian Islands.

the commanding officer, and a furlough for two months, commencing from the date of their arrival in the United Kingdom. They will also be provided with a free passage back to their regiments, unless directed to join the depôts thereof at the termination of their furloughs.

2. Soldiers who at the time of their re-engagement may be serving in India, China, Ceylon, the Mauritius, Australia, or New Zealand will be allowed 5*l.*, and those serving in Canada, at the Cape of Good Hope, at St. Helena, and in the West Indies, 3*l.*, in addition to the usual bounty, as an equivalent for the furlough granted to re-engaged men serving at other foreign stations and at home.

3. The Secretary of State also deems it expedient to point out, that although the re-enlistment of limited service soldiers at any period within two years from date of discharge has been specially permitted under Clause 27 of the Pension Regulations in the Royal Warrant of the 1st July 1848, the Limited Enlistment Act does not contemplate such a proceeding; it is, therefore, to be understood that the system which has hitherto prevailed will be discontinued (except as specially provided in Clause 6), and in lieu thereof the following will be adopted, viz.:—

4. Soldiers who may hereafter be discharged after the completion of the first term of limited service will, if of good character, and in possession at the time of their discharge of a good-conduct badge or badges, be permitted, as an indulgence to re-engage within 12 months from the date of their discharge, provided those who had previously served in the infantry are not above 32 years of age, and those in the cavalry, artillery, and engineers not above 34 years of age at the time of their re-engagement; but men re-engaging under this arrangement will only be allowed to count half the period of their former service towards claims to pensions, and must be recommended for that indulgence by their commanding officers on account of good conduct at the expiration of one year from date of re-engagement; they must also at the time of re-engagement declare the period of their former service, and cause of discharge from their last corps. They will, however, be allowed to reckon the whole of their previous service towards good-conduct pay, but will be required to serve for one year with uninterrupted good conduct from date of re-engagement before they can be permitted to resume their previous good-conduct badges, when they will, on the recommendation of their commanding officers, be entitled to receive good-conduct pay from the date of their re-engagement.

5. Soldiers of good character who may hereafter be discharged, on reduction or on account of disability, or by purchase, &c., during the first term of limited service, and who may again enlist within 12 months from the date of discharge, will be allowed the benefit of the preceding provision for reckoning former service, and resuming former good-conduct pay.

6. Limited service soldiers who may have already taken their discharges prior to the publication of the Warrant hereto annexed, and shall re-engage subsequently to such publication, will be allowed, in conformity with the regulations in force at the time of their discharge, the whole of their previous service towards pension, provided they re-engage within two years from date of discharge, and are specially recommended for this indulgence after not less than six months' renewed service.

War Office, 30th October 1861.

War Office,

Sir, 15*th July* 1862.

27 Schoolmasters. 12

I am directed by the Secretary of State for War to acknowledge the receipt of your letter of the 10th instant, and to acquaint you, in reply, that Sir George Cornewall Lewis approves of the additional bounty granted by the 2nd paragraph of the regulations annexed to the Royal Warrant of the 30th October 1861, to soldiers quartered at certain foreign stations being extended to schoolmasters abroad on their re-engagement.

I am, however, to add that garrison schoolmasters at foreign stations who have availed themselves of the free passage home and back, granted after

App. XII.

seven years' service under the conditions specified in the letter from this department to the Military Secretary of the 4th December 1861, will not be considered eligible for this additional bounty, which is given in lieu of furlough, and to avoid the expense of a double passage home and out again, and that it will therefore only be granted to garrison schoolmasters on re-engagement, provided they have not put the public to the expense above referred to.

Garrison schoolmasters abroad will thus be placed on the same footing as regimental schoolmasters in regard to this additional bounty on re-engagement as recommended by the Council of Military Education, but the former cannot be allowed both the free passage home and the bounty, which is virtually granted in lieu of it.

I am, &c.

The Adjutant-General, Horse Guards. (Signed) Edward Lugard.

War Office,
4th December 1861.

Sir,

50 Ceylon Rifles. 24

I am directed by the Secretary of State for War to acknowledge the receipt of your letter of the 9th ultimo, and to acquaint you, in reply, for the information of His Royal Highness the General Commanding-in-Chief, that, having had under his consideration the Memorandum of the Council of Military Education of the 7th ultimo relative to the leave of absence and free passages of army schoolmasters after long continuous service at foreign stations, Secretary Sir George Cornewall Lewis is of opinion that the grant of free passages as therein recommended should be restricted to garrison schoolmasters, all regimental schoolmasters being required to remove or remain with their regiments; subject, however, to this one condition, Sir George Lewis has no objection to the plan proposed by the Council, viz., that after a continuous foreign service of seven years garrison schoolmasters may, subject of course to the requirements of the service, and other "special considerations," be granted, when required to return home on urgent grounds, leave of absence with pay, and without loss of service as follows:—

Eight months for stations beyond the Cape of Good Hope;
Six months from the Cape of Good Hope, West Coast of Africa, West Indies, and Bermuda;
Four months from North America and from stations in the Mediterranean;

and also free passages, the leave of absence in each case being inclusive of the period of the voyage to and fro; and I am to add, that first-class Schoolmaster Pringle will, therefore, under the foregoing regulations, be granted pay during the period of his eight months' leave of absence.

I am, &c.

The Military Secretary, Horse Guards. (Signed) B. Hawes.

Regulations for the Appointment of Army Schoolmasters.

1. CANDIDATES for the situation of army schoolmaster are required to undergo a course of training in the schools of the Royal Military Asylum, Chelsea.

2. The following persons alone are eligible to become candidates, viz.:—
Sergeants of the regular army; corporals and privates, also of the regular army, who are in possession of at least one good conduct badge; civilian pupil-teachers who have completed their apprenticeship; certificated schoolmasters.

3. Candidates must be in good health; free from any defect of vision or voice, and from any physical deformity; they must be between 21 and 25 years of age on the day of examination; not under 5 feet 5 inches in height; and they must be unmarried.

4. The physical fitness of candidates is ascertained by an army medical officer.

Their admission to the schools is determined by the result of a competitive examination.

5. The examination* comprises the following subjects:—

Reading.—To which, however, no marks are allotted.
Writing - - } marks are assigned to the writing and spelling
Spelling - - } in the answers to the questions.
English grammar.—Accidence and elementary syntax.
Arithmetic.—Elementary rules, practice, simple and compound proportion, simple interest, vulgar and decimal fractions, and extraction of the square root.
Geometry.—Euclid, books I. and II.
Scripture history.—Outlines of historical facts of the Bible.
History of England.—From earliest period to death of Richard III.
Geography.—An outline of the geography of the world, and special knowledge of the geography of the United Kingdom, France, and Germany.

6. Candidates, if soldiers, must apply through their commanding officers to the adjutant-general; if civilians, to the Council of Military Education; in both cases forwarding, with their application, the following certificates or statements:

Certificate of age.
Statement of height.
Statement that they are unmarried.
Statement of religious denomination.
Certificate of conduct.

If the candidate is a soldier, the certificate of conduct is to be accompanied by a statement of his services, and a recommendation from his commanding officer.

If the candidate is a civilian, his certificate of conduct is to be signed by the minister of the parish, or of the congregation of which he is a member; and it must be accompanied by a recommendation from the minister or managers of the school in which he has been employed.

Civilian candidates must forward, in addition to the foregoing, such certificates as they may have received from the Committee of Council on Education, or from the Board of National Education in Ireland.

7. Should the candidate, after furnishing the above particulars, be considered eligible, he will be permitted to attend the examination next ensuing, the date of which will be communicated to him.

8. The examination of civilian candidates takes place at the Royal Military Asylum, Chelsea; but no charge against the public for expenses incurred by them during the examination, or in travelling to, or returning home from, Chelsea will be allowed.

9. Candidates from the army will be examined at the stations or in the districts in which they may be serving.

10. Each civilian candidate, if successful in the competition, will be required to execute a policy with the British Guarantee Association for the sum of 50*l.* (on which he will have to pay a premium of 3*l.*), as a guarantee for his good conduct, and for the fulfilment of his engagement to enlist in the army; and he will be required to provide himself with the following articles, of the same pattern as those in use at the Royal Military Asylum, viz.:—

6 shirts.	4 towels.
6 pairs of socks.	1 pair of boots.
3 pocket handkerchiefs.	

11. The period of residence at the Royal Military Asylum is about two years. This period, however, may be reduced, should the candidate prove himself possessed of superior qualifications at the entrance examination.

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* Usually held in January and August. Candidates should apply at least a month before.

App. XII.

12. STUDENTS are liable to removal at any time for incompetency or for want of application to their studies; and to dismissal with forfeiture of bond for misconduct.

13. During the period of their residence at the Royal Military Asylum civilian students are messed and provided with uniform at the expense of the public. Military students receive their regimental clothing and pay, subject to a deduction of 6*d.* a day for their messing; and they will be shown in the regimental returns under the head of "Absent on duty as students at the Royal "Military Asylum."

14. On completing their course of training as students, and on being reported qualified by the Council of Military Education, they will be enlisted and appointed army schoolmasters; if civilians, they will be enlisted (without bounty) for general service for the period of 10 years; if soldiers they will be discharged from their regiments and re-enlisted (without bounty) for general service for the period of 10 years, reckoning towards their pension as schoolmasters one-half of their service prior to admission to the Royal Military Asylum, but no portion of the time spent by them at the Royal Military Asylum.

15. ARMY SCHOOLMASTERS rank as non-commissioned officers next below serjeant-majors.

16. Their pay is as follows; with quarters and fuel, or allowance in lieu.

On first appointment	3*s.* 0*d.*	per diem.
After 2 years' service	3*s.* 6*d.*	,,
,, 4 ,,	4*s.* 0*d.*	,,
,, 6 ,,	4*s.* 6*d.*	,,
,, 8 ,,	5*s.* 0*d.*	,,
,, 10 ,,	5*s.* 6*d.*	,,
,, 12 ,,	6*s.* 0*d.*	,,
,, 14 ,,	6*s.* 6*d.*	,,

The above periodical increase is contingent on the good conduct of schoolmasters, and their success in the management of their schools.

17. Schoolmasters, after 21 years' service, calculated according to the regulations, are entitled to a pension of 2*s.* 6*d.* or 3*s.* per diem.

18. SUPERINTENDING SCHOOLMASTERS are selected from the army schoolmasters for merit and service. They receive commissions as officers, with the relative rank of ensign. Their pay varies from 7*s.* to 8*s.* a day according to service; with quarters or lodging money; and with an allowance of 1*s.* a day in lieu of a soldier servant.

19. Superintending schoolmasters may, with the sanction of the Commander-in-Chief and the Secretary of State for War, be permitted to retire after an aggregate service of 30 years, calculated in conformity with the regulations, on an allowance of 7*s.* 6*d.* or 8*s.* per diem.

20. The widows of superintending schoolmasters will be eligible for pensions, and their children for an allowance from the Compassionate Fund, under the regulations applicable to officers of corresponding rank.

21. All schoolmasters are subject to the Mutiny Act, and to the rules and discipline of the service.

D. Greentree, Capt.,
Secretary.

Office of the Council of Military Education,
13, Great George Street, S.W.,
15th April 1863.

VICTORIA R.

Whereas it has been represented to Us that it is expedient to revise the regulations hitherto in force in regard to the pay and position of trained army schoolmasters, and to confer upon such as shall be appointed superintending schoolmasters a commission with the relative rank of ensign;

Our will and pleasure is that the following rules shall be established. The rates of full pay shall be :

	s.	*d.*	
Superintending schoolmaster on appointment - -	7	0	per diem.
Do. Do. after 14 years' service as trained schoolmaster, of which 5 years shall have been as superintending schoolmaster - -	8	0	,,
Trained schoolmaster ranking as non-commissioned officer next below serjeant-major, on appointment -	3	0	,,
After 2 years' service - - - - - -	3	6	,,
,, 4 ,, - - - - -	4	0	,,
,, 6 ,, - - - - -	4	6	,,
,, 8 ,, - - - - -	5	0	,,
,, 10 ,, - - - - -	5	6	,,
,, 12 ,, - - - - -	6	0	,,
,, 14 ,, - - - - -	6	6	,,

The periodical increase shall, however, only be granted on the recommendation of the Council of Military Education to such trained schoolmasters of whom satisfactory reports are received, both in regard to general conduct, and the management and progress of their schools. Each year's service as assistant or fourth-class schoolmaster under the former regulations being allowed to reckon as six months towards the above periods.

Time spent at the Royal Military Asylum in qualifying for appointment as trained schoolmaster, whether the candidates are from civil life or from the ranks of the army, is not to reckon for the above rates of increased pay ; service from date of appointment as trained schoolmaster being alone admissible.

Superintending schoolmasters, who on promotion to that rank were in the receipt of 8*s.* a day, will be permitted to retain that pay, but without further increase.

The rate of half-pay or retiring allowance for a superintending schoolmaster shall in all cases be determined by the service which he may have rendered to the public as schoolmaster, or in any former military capacity.

If a superintending schoolmaster shall have served at least 10 years as a trained or superintending schoolmaster, he shall, in case of being placed on half-pay by disability or ill health, duly certified by an army medical board to the satisfaction of the Commander-in-Chief and the Secretary of State for War, be allowed half-pay according to the following scale, viz.:—

	s.	*d.*	
Ten years' total service, and under five as superintending schoolmaster - - - - - -	3	0	per diem.
Ditto, with five years' service, or upwards, as superintending schoolmaster - - - - -	4	0	,,
Fifteen years' total service, of which five, or upwards, as superintending schoolmaster - - - -	4	6	,,
Ditto, of which ten as superintending schoolmaster -	5	0	,,
Twenty years' total service, of which five, or upwards, as superintending schoolmaster - - - -	5	6	,,
Ditto, of which ten as superintending schoolmaster -	6	0	,,
Twenty-five years' total service, of which five, or upwards, as superintending schoolmaster - -	6	6	,,
Ditto, of which ten as superintending schoolmaster -	7	0	,,

Every superintending schoolmaster who shall have served for an aggregate period of thirty years, of which five years, or upwards, shall have been as superintending schoolmaster, may, with the sanction of the Commander-in-Chief and Secretary of State for War, be permitted to retire on 7*s.* 6*d.* a day.

Ten years as superintending schoolmaster, with an aggregate service of thirty years - - - - -	8*s.* per diem.

In calculating the service for half-pay, the whole of the period passed as a student in the training schools of the Royal Military Asylum will be excluded, but half of the service in any former military capacity will be allowed.

App. XII.

Schoolmasters, when placed on the pension list, will be entitled to pensions according to the following scale :—

	s.	d.	
After twenty-one years' service during the last three years of which they shall have been in the receipt of the highest rate of pay - - - - - -	3	0	per diem.
After twenty-one years' service, and should they not have been uninterruptedly in the receipt of the highest rate of pay during the last three years - - -	2	6	,,

The cases of schoolmasters invalided before the completion of twenty-one years' service will be specially considered by the Commissioners of Chelsea Hospital.

In calculating the time of service of a superintending schoolmaster for half-pay, or of a schoolmaster for pension, the whole of the period passed in the training schools of the Royal Military Asylum, as well as half of any former service in the army, prior to his admission thereto, are to be deducted.

Given at our court at St. James', this Nineteenth day of May 1863, in the twenty-sixth year of our reign.

By Her Majesty's Command.
(Signed) De Grey and Ripon.

CIRCULAR MEMORANDUM.

Addressed to the Army at Home and Abroad.

Gen. No. 275.

Horse Guards, S.W.,
5th October 1863.

(Schools.) 3—(1863.)

Questions having arisen on certain points relative to the pay and position of army schoolmasters who may wish to be placed under the regulations of the 25th May 1863, the following decisions of the Secretary of State for War, in concurrence with His Royal Highness the Field Marshal Commanding-in-Chief, are hereby notified for general information and guidance :—

1. Schoolmasters of less than four years' service, who are desirous of accepting the new regulations, will not be required to relinquish any portion of their present pay of 4*s.* a day; but they will not be allowed any increase to their pay until they have served six years, when they will, if duly recommended, be entitled under those regulations to receive an increase of 6*d.* a day.

2. Other schoolmasters on accepting the new regulations as to pay and promotion will draw the pay corresponding to their service as laid down in Article 4 of the regulations, provided they are duly recommended for the same as required in that article.

3. A 2nd-class schoolmaster who may accept the new regulations will not receive the additional shilling a day after re-engagement, nor any increase to his pay until he has completed twelve years' service as schoolmaster; when, if recommended by the Council of Military Education, his pay will be increased from 5*s.* 5*d.* to 6*s.* per diem.

4. The periodical increase of pay is not to be considered in the light of good-conduct pay, which, under certain circumstances, may be forfeited. It becomes, on the contrary, an integral part of the schoolmaster's salary.

6. A schoolmaster who remains under the old regulations will, if re-engaged, be entitled to receive the additional one shilling per diem granted by those regulations to schoolmasters after completing 10 years' schoolmaster's service.

6. In respect to promotion of those schoolmasters who remain under the old regulations, the present proportions between the different classes will be, as far as possible, maintained.

Should, however, those proportions be disarranged by a large number in any class accepting the new regulations, promotions from that class will be granted in the proportion which its numbers, thus reduced, bear to its present strength, provided there remain in it schoolmasters of sufficient experience and efficiency to justify such promotion.

Thus, if one-half of any class remain under the old system, promotion will

be granted to it for one-half of the vacancies that may occur in the higher classes, provided the above conditions be fulfilled.

This method will be continued until the original proportion between the several classes is regained.

7. As regards comparative rank, a schoolmaster of the 2nd class will take precedence over all army schoolmasters under the new regulations who have shorter service.

Where a schoolmaster, who retains the position of a 2nd class, and an army schoolmaster who, having been passed over, may have since come under the new regulations, and who may have greater length of service, are engaged in the same schoolroom, a special reference will be made to the adjutant-general as to which schoolmaster shall take precedence. Should an immediate decision be requisite, the officer commanding at the station will exercise his discretion pending such reference, which is to contain the fullest particulars of the case submitted for consideration.

Where a schoolmaster of the 3rd class, and an army schoolmaster under the new regulations, are engaged in the same schoolroom, they will take precedence according to the date of their appointment as schoolmasters.

The time allowed for the acceptance of the new regulations is extended until the 31st March next.

By Command of His Royal Highness,
The Field Marshal Commanding-in-Chief.

JAMES YORKE SCARLETT,
Adjutant-General.

INDEX TO THE ARMY SCHOOL REGULATIONS.

	Para.
Absence;	
Leave to Schoolmasters	139
,, Foreign Stations	Appendix.
,, on Re-engagement	19
Leave to Schoolmistresses	87
,, for Illness	88
Accommodation;	
School, Deficiency	120
Acting Schoolmasters;	
A Soldier to be trained	46–4
Acting Schoolmistresses;	
When allowed, and Pay of	79, 90
On board Ship	49
Appointment of a Schoolmaster to a Regiment	40
Appointment of a Schoolmaster from the Royal Military Asylum	13
Arrest of Schoolmasters	43
Assistant Schoolmasters;	
Persons eligible	75
Number allowed	78
Qualifications to be reported upon	85
Attendance;	
Register of	112
Nominal Return of	113
Attestation on Appointment or Transfer of a Schoolmaster	40, 41
Baggage allowed to Schoolmaster	35
,, ,, Schoolmistress	69
Barrack Serjeants;	
Children admitted to Schools	107
Bible Lesson;	
Rules	95–98
Infant Schools	130
Blank Forms to be had on Requisition	123
Books;	
Rules for Requisition	122
Form of Requisition	Appendix.
Bounty on Enlistment not allowed	15
,, on Re-engagement	18
Candidates;	Para.
Age of	11
Enlistment of	14
Persons eligible, Males	10
,, Females	71, 72
Training of Male	9, 12, 13
,, Female	72, 73, 77
Children admitted to Schools	105–110
Civilians;	
Children of, to Schools	109
Eligible as Candidates	10
Clothing allowed to Schoolmasters	36
Supply of, Circular	Appendix.
Communications (Official) by Schoolmaster;	
Rules for	44
Correspondence;	
Rules for	142, 143
Damages of School Property;	
Rules	124
Quarterly Returns of	126
Deficiency in School Accommodation;	
How dealt with	120
Deficiency in Light for School	121
Detachment Schoolmaster;	
How obtained, and Pay	48
Detachment Schoolmistress;	
When allowed, and Pay	80
Detachment Schools;	
Inspection by Schoolmaster	128
Detention Allowance;	
Schoolmasters	28
Discipline	3, 43
Enlistment;	
Civilians for Ten Years	14
Soldiers	14
No Bounty	15
Fees;	
Rate of, for Admission of Children to Schools	105–110
Rate of, for Admission of Children to Industrial Schools	136

App. XII.

Fees; Para.
- Rate of, for Admission of Children to Infant Schools - 136
- Portion of a Month or Week to be paid for as a whole - 111
- Non-Regimental - - - 116
- All Fees to be credited to the Public - - - - 111
- How collected - - - 117
- To be shown in Monthly Return 111
- Quarterly Return of - - 117

Fuel;
- Schoolrooms - - - 121
- Superintending Schoolmaster 20, 21
- Schoolmaster - - 22–24
- Schoolmistress - - 63–66

Furlough on Re-engagement - - 19

Furniture;
- Superintending Schoolmaster - 21
- Schoolmaster - - - 22, 23
- Schoolmistress - - 63–66

Gratuitous Admission to Schools - 106

Half-Pay;
- Superintending Schoolmaster - 6
- Mode of calculating Service for - 8

Half Holidays - - - - - 58

Holidays - - - - - - 139

Industrial Schools;
- Under Trained Mistresses - 132
- Where held - - - - 132
- What Children attend - - 132
- Fees - - - - - 136
- Instruction - - - - 132
- Pecuniary Grant - - 133, 134
- Work to be done - - - 135
- „ how to be disposed of - 133
- Register of Attendance - - 137

Infant Schools;
- Under Trained Mistresses - 1
- One to each Regiment and Depôt Battalion - - - - 129
- To be separate from other Schools 131
- Class of Children admitted - 129
- Boys above Eight excluded - 131
- Opening of, Rules - - - 130
- Hours of Attendance - - 131
- Maximum Attainments of Children - - - - - 131
- Schoolmistress has sole Charge - 129
- To be inspected by Schoolmaster 138

Inspection;
- Rules for - - - - - 141
- Of Detachment Schools by Schoolmaster - - - 128
- *Reports* to include all Assistants 85

Kitchen for Schoolmasters - - 22

Labourers (Garrison), Children of, admitted - - - - 108

Leave of Absence - - - - 139
- Schoolmistresses on Medical Certificate - - - - - 88

Light;
- Schoolrooms - - - 121
- Schoolmaster - - 22–24
- Schoolmistress - - 63–66
- Superintending Schoolmaster 20, 21

Lodging Allowance;
- Superintending Schoolmaster - 20
- Schoolmaster at home - - 24
- „ abroad - - 25
- Schoolmistress - - 63–66

Loss of School Property;
- Rule - - - - - 124

Marching Allowance to Schoolmasters - - - - - 27
- Allowance to Schoolmistresses 67, 68

Marriage;
- Permission required - - 38

Material;
- Rules for Requisition - - 122
- Transfer - - - 125

Medical Treatment - - - 42

Misconduct of Schoolmasters - 43

Monitresses;
- Persons eligible - - - 81
- When allowed - - - 83
- Instruction of - - - 84
- Qualifications to be reported upon - - - - 85

Monthly Reports - 111, 118, 140

Music;
- Important Qualification in Schoolmistresses - - 72

Opening of Schools - - 94–100

Orderly allowed as Servant to Schoolmaster - - - 45

Passage on board Ship - 33, 70

Pay issued weekly by Paymaster - 5
- Monitresses - - 82

Pupil-teachers - - - 74

Schoolmasters - - - 4
- „ Acting - - 47
- „ Assistant Soldier 50
- „ Detachment - - 48
- „ Superintending - 4, 5

Schoolmistresses - - - 60
- „ Acting - - 79
- „ Assistant - 76
- „ Detachment - 80

Pension;
- Schoolmaster 7, 8, and Appendix.
- Superintending Schoolmaster 6, 8, and Appendix.
- Schoolmistresses - - 61, 62

Pensioners' Children admitted to Schools - - - 107, 108

Prayer at opening of School - - 94
- Attendance of Adults voluntary - 97
- Attendance of Children of other Persuasions voluntary - - 98

Prisons (Military);
- Children of Warders and Servants of - - - - 107

Private Tuition prohibited - - 39

Promotion;
- Schoolmasters' - - - 45
- Schoolmistresses' - - - 59

Property; Transfer of - - 125

Punishment of Schoolmasters - 43

Pupil-teachers;
- Persons eligible - - - 74
- Number allowed - - - 78
- Qualifications to be reported upon - - - - 85

Quarterly Returns;
- Payments - - - - 111, 117
- Repairs - - - - 126

Quarters;
- Schoolmaster - - 22, 23
- Schoolmistress - - 63, 66

Rations, free;
- To Families abroad - - - 34

Re-engagement of Schoolmaster 16, 17
- Furlough allowed sometimes - 19
- Furlough allowed on Foreign Stations (*Circular*) - Appendix.

Re-enlistment of a Military Candidate - - - - - 14
- Circular regarding - - Appendix.

Register of Attendance - - 112

Relief;
- Transfer of School Property - 125

Religious Denomination of Schoolmasters to be recorded - - 56

Religious Instruction on Week Days;
- Master and Mistress to assist - 101
- To be fixed by Com. Officer - 103

Religious Instruction to be undisturbed by Secular Instruction 103

Repairs of School Property - - 126

Reports, Monthly, of Fees - 111, 115
- „ of School - 118, 140

Half-yearly - - - - 119

Para.

Returns, Half-yearly, of Education - 119
Of School Attendance, *Monthly* 113, 114
Nominal, of Special Children - 115
Quarterly, of Payment, *Monthly* 111, 117
Of estimated Cost of Repairs; *Quarterly* - - - - 126
Requisitions for School Books and Material - - - - 122
Forms for - - - Appendix.
Retiring Allowance;
Superintending Schoolmaster - 6, 8
Salute;
Schoolmasters must salute Officers - - - - 37
Saturday Half Holiday - - 58
School Department;
Under Council of Military Education - - - - 2
School Books;
Rule for estimating Numbers on 111
School Day;
Length of - - - - 57
Schools;
Object of - - - - 1
Adult; how superintended - 1
„ Admission gratuitous - 104
Grown Children - - - 1
What Children admitted - 105–110
Hours - - 57, 94, 99, 100
Opening - - - - 94
On board Ship - - - 49
Register of Attendance - 112, 113
Schoolmasters;
Two Classes - - - 3
Rank of - - - - 3
Subject to Mutiny Act - - 3
Not under Authority of Non-commissioned Officer - - 3
Must salute Officers - - 37
Prohibited from private Teaching 39
Appointment to Regiments - 40
Acting; Soldiers to be trained - 46
Allowed an Orderly - - 45
Schoolmistresses;
Classes - - - - 59
Persons eligible - - 71, 72, 77
Not under Authority of Schoolmasters - - - - 138
Unemployed List - - 88–91
Unmarried, need not live in Barracks - - - - 66
Lodging Money in Vacations - 66
Commuted Allowance for Fuel, &c. 66
Acting; when allowed - 79, 90
Assistant - - - 75–78
Supernumerary - - - 89
Passages - - - - 70
Servant;
Allowance to Superintending Schoolmasters - - - 45
Orderly to Schoolmasters - 45
Servants of Military Prisons;
Children admitted to Schools - 107

Para. App. XII.

Servants of Officers;
Children admitted to Schools - 110
Soldier Assistants;
Rules regarding - - 51, 52
Soldiers, deceased, Children of, admitted to Schools - - 107
Soldiers, discharged, and employed in Garrisons, admitted to Schools 107
Stationery;
Rules for Requisition - - 122
Sunday Duties of Schoolmasters 53–56
Of Schoolmistresses - - 93
Sunday Schools are under the Chaplains - - - - 54
Training:
Male Candidates - - 9, 12, 13
Time at Chelsea does not count for Pension, &c. - - - 4
Female Candidates - 72, 73, 77
Schools for Female Candidates - 72
„ Qualifications required for Entry - - 72
Transfer of Schoolmaster - - 41
Of School Property - 125, 127
Travelling Allowance;
Superintending Schoolmaster - 26
Marching with Troops, Schoolmaster - - - - 27
Marching with Troops, Schoolmistress - - - 67, 68
To join a Regiment, Schoolmaster - - - 29, 30
To join a Regiment, Schoolmistress - - - 67, 68
Visiting Detachment Schools, Master - - - 29, 30
Visiting Detachment Schools, Mistress - - 67, 68
On Removal or Transfer, Master 31, 32
„ „ Mistress 67
On board Ship, Master - - 29
„ Mistress - - 70
By Railway, Master - - 29
„ Mistress - - 67
On board Ship, Accommodation, Master - - - - 33
On board Ship, Accommodation, Mistress - - - - 70
Baggage allowed, Master - - 35
Mistress - - 69
Unemployed List;
Schoolmistresses after Three Months' Absence - - - 88
Schoolmistresses Vacancy to be filled up - - - - 89
Schoolmistresses when declining to join - - - - 91
Schoolmistresses after Two Years to be removed - - - 92
Warders of Military Prisons;
Children admitted to School - 107
Waste;
Rules for preventing - - 124
Weekly Duties;
School Hours - - - 57

App. XIII. No. 1.

Appendix XIII.—No. 1.

Result of the Examination of the under-mentioned Non-Commissioned Officers and Civilians—Candidates for admission to the Normal School.—August 1861.

Order of Merit.	Names.	Scripture.	English History.	Geography.	English Grammar.	Arithmetic.	Total.	Previous Profession.	Remarks.
	Full marks -	60	60	60	60	60	300		
1	Grant, John - -	45	50	53	46	53	247	Corporal, 43rd Foot -	Admitted.
2	Short, Thomas -	43	37	41	41	60	222	National School Teacher.	
3	Williams, David W.	43	22	33	33	56	187	Civilian - -	
4	M'Rae, Christopher -	32	32	32	30	55	181	Corporal, 2nd Batt. Scotch Fusilier Guards.	
5	Boland, John -	4	23	45	38	48	158	Serjeant, 2nd Batt. 20th Foot.	
6	Ogg, George - -	36	6	42	40	32	156	National School Teacher.	
7	Perkins, John C. -	31	25	38	17	41	152	Civilian - -	
8	Sessford, John R. -	33	19	35	28	34	149	National School Teacher.	
9	Spong, George -	19	26	40	25	32	142	School Teacher -	
10	Coughlan, John -	12	18	31	20	60	141	Lance-serjeant, 2nd Batt. 18th Foot.	
11	M'Nally, Patrick -	12	29	20	37	40	138	Corporal, 2nd Batt. 15th Foot.	Qualified, but no vacancies.
12	Jackson, William, R.	12	37	53	13	15	130	Civilian - -	
13	M'Leod, J. - -	25	22	25	26	31	129	Corporal, 78th Foot -	
14	Moore, William, T. -	14	16	37	30	29	126	National School Teacher.	
15	Chamberlain, J. -	—	20	43	40	21	124	School Teacher -	
16	Protherough, Thos. J.	29	17	38	17	22	123	National School Teacher.	
17	Pilditch, Frank -	18	15	37	22	28	120	Civilian - -	
18	Smith, G - -	8	17	37	17	29	108	Corporal, 1st Batt. 11th Foot.	
19	Mayer, A. - -	20	24	23	23	15	105	Corporal, 10th Hussars.	
20	- - - -	14	2	28	32	25	101	Civilian - -	Not qualified.
21	- - - -	10	12	31	13	30	96	Civilian - -	
22	- - - -	15	15	10	15	25	80	Civilian - -	
23	- - - -	—	—	11	5	44	60	Non-commissioned Officer -	
24	- - - -	2	3	29	5	10	49	Non-commissioned Officer -	
25	- - - -	2	4	14	16	6	42	School Teacher -	
	*Morgan, Thomas -	36	6	41	30	21	134	Corporal, Rl. Marines	

* Not included in the competition.

RESULT of the EXAMINATION of the under-mentioned FOURTH CLASS SCHOOLMASTERS for admission to the NORMAL SCHOOL, ROYAL MILITARY ASYLUM.—January 1862. APP. XIII. No. 1.

Order of Merit.	Names.	Scripture.	English History.	Grecian History.	Roman History.	English Grammar.	Geography.	Arithmetic.	Euclid.	Total.
	Maximum - -	100	100	100	100	100	100	100	100	800
1	Porter, John R. - -	85	65	60	50	64	83	54	100	561
2	Wilson, C. M. - -	88	55	53	49	68	62	67	64	506
3	Bell, John H. - -	60	66	5	21	70	76	63	67	428
4	Kavanagh, J. G. - -	63	53	40	40	61	49	80	29	415
5	Pither, James R. - -	85	55	35	18	45	50	57	24	369
6	Morgan, Wm. - -	68	43	13	8	42	44	35	17	270

RESULT of the EXAMINATION of the under-mentioned NON-COMMISSIONED OFFICERS and CIVILIANS—Candidates for admission to the NORMAL SCHOOL, ROYAL MILITARY ASYLUM.—August 1862.

Order of Merit.	Names.	Scripture.	English History.	English Grammar.	Geography.	Arithmetic.	Total.	Previous Profession.	Remarks.
	Maximum -	100	100	100	100	100	500		
1	Proffatt, J. -	91	54	67	56	100	368	Corporal, 29th Foot -	Admitted.
2	M'Phee, J. -	75	60	56	48	55	294	Corporal, 79th Foot -	
3	Finnigan, E. -	46	40	67	54	49	256	National School Teacher.	
4	Armstrong, R. -	59	22	53	45	47	226	Civilian - -	
5	Carr, *d.* - -	44	54	65	41	21	225	Civilian - -	
6	Hall, W. H. -	41	30	34	38	75	218	Civilian - -	
7	Lanning, H. -	32	54	55	24	49	214	Civilian - -	
8	Jones, J. - -	40	27	44	46	54	211	National School Teacher.	
9	Healey, T. -	34	30	65	39	36	204	Civilian - -	Qualified, but no vacancies.
10	M'Nally, P. -	26	13	57	29	68	193	Corporal, 2nd Batt. 15th Foot.	
11	Gillbanks, P. -	41	14	41	43	36	175	National School Teacher.	
12	Neels, W. - -	49	27	36	50	12	174	National School Teacher.	
13	Walter, A. C. -	37	40	39	44	13	173	Corporal, 58th Foot -	
14	Orton, M. - -	33	34	21	29	49	166	Civilian - -	
15	- - -	21	10	44	32	56	163	Non-commissioned Officer.	
16	- - -	37	27	39	28	31	162	Civilian - -	Not qualified.
17	- - -	19	15	35	26	31	126	Non-commissioned Officer.	
18	- - -	27	16	20	15	38	116	Civilian - -	
19	- - -	14	6	29	12	40	101	Civilian - -	
20	- - -	14	5	20	5	24	68	Civilian - -	
21	- - -	2	10	12	10	4	38	Non-commissioned Officer.	
22	- - -	2	—	13	—	5	20	National School Teacher.	
	*Brown, J. -	25	39	50	42	65	225	Serjeant, 2nd Batt. 3rd Foot.	

* This Non-commissioned Officer was examined abroad, and did not join until January 1863.

APP. XIII. No. 1.

RESULT of the competitive EXAMINATION of the under-mentioned NON-COMMISSIONED OFFICERS AND CIVILIANS—Candidates for admission to the NORMAL SCHOOL, ROYAL MILITARY ASYLUM. —January 1863.

Order of Merit.	Names.	Scripture.	English History.	English Grammar.	Geography.	Arithmetic.	Ancient History.	Total.	Previous Profession.	Remarks.
	Maximum -	100	100	100	100	100	50	550		
1	Walters, R. -	89	70	44	68	58	17	346	Civilian.	Admitted, with the exception of Nos. 5 and 8.
2	Ewart, P. -	76	75	63	84	39	2	339	Corporal, 1st Batt. 10th Foot.	
3	Edmonds, A. -	46	76	38	88	49	2	299	National School Teacher.	
4	Abbott, J. -	87	39	45	56	45	10	282	Civilian - -	
5	*- - -	65	47	36	57	38	—	243	National School Teacher.	
6	Walters, A. C. -	44	47	45	66	23	—	225	Corporal, 58th Foot.	
7	Healey, P. -	53	37	44	59	31	—	224	Civilian - -	
8	†- - -	58	26	29	55	49	—	217	National School Teacher.	
9	M'Nally, P. -	27	38	61	35	38	—	199	Serjeant, 2nd Batt. 15th Foot.	
10	Probert, J. -	58	30	20	37	33	7	185	National School Teacher.	Qualified, but no vacancies.
11	M'Governe, S. J.	34	55	24	57	12	—	182	Corporal, 36th Foot.	
	Courtney, C. -	42	26	20	52	35	7	182	Civilian - -	
13	Ivy, R. - -	63	26	26	34	26	—	175	Civilian - -	
14	Moore, W. -	57	35	25	32	22	—	171	National School Teacher.	
15	Baker, J. -	34	21	35	42	27	11	170	Civilian - -	
16	- - -	47	36	34	30	14	—	161	Civilian - -	Not qualified.
17	- - -	40	31	29	22	38	—	160	Civilian - -	
18	- - -	26	22	27	45	34	3	157	Non-commissioned Officer.	
		—	5	51	35	62	4	157	Non-commissioned Officer.	
20	- - -	11	24	44	53	6	7	145	Civilian - -	
21	- - -	17	25	13	29	17	2	103	Non-commissioned Officer.	
22	- - -	12	2	34	8	3	—	59	Non-commissioned Officer.	

* Under the height. † Medically rejected.

App. XIII. No. 1.

RESULT of the competitive EXAMINATION of the under-mentioned NON-COMMISSIONED OFFICERS, SOLDIERS, and CIVILIANS—Candidates for admission into the NORMAL SCHOOL, ROYAL MILITARY ASYLUM, CHELSEA.—August 1863.

Order of Merit.	Names.	Scripture.	English History.	English Grammar.	Geography.	Arithmetic.	Euclid.	Total.	Remarks on Reading.	Previous Profession.	Remarks.
	Maximum -	100	100	100	100	100	100	600			
1	Jordan, W. E. -	77	80	83	76	77	70	463	Tolerably good.	National School Teacher.	Qualified for admission to the 1st Division.
2	Porter, J. -	75	45	66	88	43	49	366	Fair -	National School Teacher.	
3	Floyd, W. -	74	66	92	58	40	80	360	- - -	Corporal, 1st Batt. 5th Foot.	Qualified for admission to the 2nd Division.
4	Burton, J. W. -	67	54	56	82	64	32	355	Moderate	National School Teacher.	
5	Harris, W. -	40	44	70	74	46	75	349	Very moderate.	Certificated Schoolmaster.	
6	Baker, J. -	52	51	59	78	58	50	348	Fair -	Civilian -	
7	Hawkins, W. -	59	55	39	52	75	44	324	„ -	Private, 2nd Batt. 4th Foot.	
8	Shaw, G. -	48	40	55	61	22	78	304	„ -	Corporal, 30th Foot.	
9	Wonnacott, W.	64	46	33	66	43	50	302	„ -	National School Teacher.	
10	- - -	72	44	56	74	17	22	285	„ -	Non-commissioned Officer.	
11	- - -	33	50	72	78	37	11	281	„ -	Non-commissioned Officer.	
12	- - -	70	42	50	54	38	31	277	Moderate	Civilian -	Not qualified.
13	- - -	—	31	56	59	55	15	216	„ -	Non-commissioned Officer.	
14	- - -	32	24	36	55	7	44	198	„ -	Non-commissioned Officer.	
15	- - -	28	34	44	41	34	7	188	„ -	Non-commissioned Officer.	
16	- - -	12	15	34	40	13	—	114	„ -	Non-commissioned Officer.	

App. XIII. No. 2.

RESULT of the EXAMINATION of the under-mentioned NON-COMMISSIONED OFFICERS and CIVILIANS—Candidates for admission to the NORMAL SCHOOL, ROYAL MILITARY ASYLUM.—January 1864.

Order of Merit.	Names.	Scripture.	English History.	English Grammar.	Geography.	Arithmetic.	Euclid.	Total.	Previous Profession.	Remarks.
	Maximum -	100	100	100	100	100	100	600		
1	Small, J. -	67	53	78	77	74	86	435	Private, 26th Foot.	Admitted.
2	Compton, J. B.	22	53	81	82	86	80	404	Certificated Schoolmaster.	
3	Mallory, F. -	75	59	34	60	83	86	397	Private, 13th Hussars.	
4	Annett, E. -	37	48	54	67	51	62	319	Lance-serjeant, 2nd Batt. 3rd Foot.	Qualified, but no vacancy.
5	- - -	9	25	70	50	49	54	257	National Sch. Teacher.	Not qualified.
6	- - -	31	28	40	65	36	30	230	Civilian -	
7	- - -	38	23	22	47	22	21	173	Non-commissioned Officer.	
8	- -	12	26	40	57	13	21	169	Non-commissioned Officer	
9	- - -	16	22	33	44	29	2	146	Private -	
10	- - -	18	12	21	31	19	—	101	Non-commissioned Officer.	

There are at present two coloured men in the Royal Military Asylum, who passed a qualifying examination in the West Indies, for special service as schoolmasters in the West India regiments.

APPENDIX XIII.—No. 2.

EXAMINATION of CANDIDATES for ADMISSION to the NORMAL SCHOOL, ROYAL MILITARY ASYLUM.—January 1864.

ARITHMETIC.

1. Reduce $\frac{633301 2}{77 \cdot 03 45}$ to its lowest terms. Find the G.C.M. of 1,710, 465, 14,616, and 81. Find the L.C.M. of 1,258, 782, and 1,702.

2. Reduce the expression $12\frac{9}{16} - \frac{31}{15} + 14\frac{13}{14} - \frac{17}{90} + 3\frac{2}{7}$ of $\frac{21}{5}$ to its simplest form.

3. Reduce $\frac{3}{125}$ and $\frac{355038}{333333}$ to decimals.

4. Multiply 404·04 by ·070707. Divide ·00002555 by ·511. Also divide the same dividend by 51,100.

5. A number of subscribers contributed in equal shares a sum of 14,525*l.* towards an enterprise, which was afterwards abandoned. The money was returned to the subscribers after the expenses incurred, amounting to 523*l.* 10*s.* 3*d.*, had been paid out of the fund, and each of them received 538*l.* 10*s.* 4½*d.* How many subscribers were there?

6. Find the value of 3,061 cwt. 2 qrs. 15 lbs., at 7*l.* 10*s.* 9*d.* per cwt.

7. A sum of 6,725*l.* 4*s.* yields an annual income of 305*l.* 12*s.* 6*d.* What would 10,621*l.* 17*s.* 2*d.* yield at the same rate of interest?

8. Extract the square root of 3,080¼, and the cube root of 9·528128.

Euclid.

1. Define the terms *plane angle, figure, parallel, straight lines, parallelogram.*

2. The angles at the base of an isosceles triangle are equal to one another; and if the equal sides be produced, the angles on the other side of the base shall be equal.

3. If two straight lines cut one another, the vertical or opposite angles shall be equal.

4. The greater angle of every triangle is subtended by the greater side, or has the greater side opposite to it.

5. Parallelograms upon the same base and between the same parallels are equal to one another.

6. If the square described upon one of the sides of a triangle be equal to the squares described upon the other two sides of it, the angle contained by these two sides is a right angle.

7. If a straight line be divided into any two parts, the squares of the whole line, and of one of the parts, are equal to twice the rectangle contained by the whole and that part, together with the square of the other part.

8. To describe a square that shall be equal to a given rectilineal figure.

Scripture.

1. What are the meanings of the words Bethel, Mahanaim, and Peniel respectively? To what events in the life of Jacob have they reference?

2. Mention some of the prophecies which speak of the call of the Gentiles.

3. Give a short sketch of the lives of Samuel, Elijah, and Elisha.

4. Who were the Pharisees, Sadducees, Essenes, and Herodians?

5. Give full particulars of the transfiguration. In which gospels is it recorded? Quote the words with which St. Peter alludes to it in one of his Epistles.

6. Relate all that passed between our Lord and Pilate, and mention in which Epistle it is stated that Christ Jesus "before Pontius Pilate witnessed a good confession."

English Grammar.

1. Give a definition and an example of *a consonant, a vowel, a mute, a syllable, a dipthong, an improper dipthong, an article, an abstract noun, a collective noun, a definitive adjective.*

2. What is the rule for the formation of the *plural* of nouns ending in *f* and *fe?* Write down four words ending in *f* or *fe* which *do not* form their plural according to the rule. Of what number is each of the following nouns—*Ethics,* 10 *stone, riches, deer, dice, series, superficies, antipodes?*

3. Name and define the three principal species of pronouns.
Decline the personal and the relative pronouns.

4. Name and define the *three degrees of comparison.* What parts of speech are susceptible of *comparison?* Write down three adjectives which *are not* susceptible of *comparison.*

App. XIII. No. 2.

5. Define the term, *mode of a verb*. Name the principal modes, and illustrate each by an example in a short sentence.

6. Give a complete etymological and syntactical description of each word underlined in the following sentence, quoting the rule of syntax corresponding to the syntactical description (N.B.—A rule of syntax once quoted may be marked by a letter or figure for future reference).

"*At this* moment, *his* position, *take it* for *all* in all, *was*, I am *inclined to believe, what no* other man *had won* for *himself* by the pen *alone*."

English History.

1. Name the most distinguished Roman generals who were engaged in the reduction of Britain, and give a short account of the services of Julius Cæsar, Aulus Plautius, and Agricola respectively.

2. Relate the history of Alfred the Great.

3. Describe with dates the reduction of Ireland in the reign of Henry II., and the conquest of Wales in that of Edward I.

4. Name and describe with dates the most remarkable battles fought between the Scotch and the English.

5. Who was Edward the Black Prince? Give an account of the military affairs in which he took part.

6. Give some account with dates of the Wars of the Roses. Show by means of a genealogical table the relationship in which the princes of the houses of York and Lancaster stood to each other and to Edward III.

Geography.

1. What are the names of the different kinds of waters on the face of the globe? Give a definition of each kind, and illustrate it by an example.

2. Beginning at the mouth of the river Don, trace mentally the coast-line of Europe, and name successively, in order, the countries of which the coast-line is so traced, and the capitals of those countries; the chief rivers of which the mouths are crossed; the seas adjoining the coast-line as it is traced; the straits passed through; and the principal capes on the coast-line.

3. Name the principal manufactures of Great Britain and Ireland, specifying the parts of those countries where each is principally carried on.

4. Name the principal mineral productions of Spain, Austria, and England.

5. Enumerate the principal agricultural productions of France.

6. Describe the main directions of the courses (or the main changes of the directions of the courses, if any such changes occur) of each of the following rivers, and name at least one town on the banks of each —*Thames, Rhone, Volga, Danube.*

7. Describe the position, the principal objects of trade or manufacture, and the etymology of the name, of each of the following places. Name also the river (if any) on which each is situated—*Newcastle, Aberdeen, Amsterdam, Hamburgh, Naples, Constantinople, St. Petersburg.*

EXAMINATION of the 1st DIVISION of the NORMAL SCHOOL, ROYAL MILITARY ASYLUM, in December 1861.

Order of Merit.	Names.	Index Number.	Arithmetic.	Algebra.	Euclid.	Logarithms and Trigonometry.	Mechanics.	Total.	Scripture History.	English Grammar.	Geography.	History.				Chemistry.	Drawing.	Fortification.	Vocal Music.	Total.	Remarks.
												English.	Roman.	Grecian.	Colonial.						
	Maximum Marks -	—	100	100	100	100	100	500	100	100	100	100	100	100	50	75	50	50	50	1375	
	Minimum Marks -	—	50	50	50	50	50	250	50	50	50	50	50	50	25	37	25	25	25	687	
1	Fryer, W. - - -	18	100	76	97	98	87	458	90	91	100	85	77	93	40	70	50	40	50	1244	
2	Brown, W. J. - -	17	80	75	82	66	83	386	98	91	100	100	92	100	50	65	50	33	49	1214	
3	Davidson, T. - -	13	89	67	65	86	79	386	63	68	100	72	73	96	37	25	40	41	26	1027	
4	Ship, Corporal S. -	10	89	78	83	69	66	385	80	72	82	71	70	68	25	35	45	40	44	1017	
5	Bryan, W. - - -	15	88	58	68	68	73	355	50	62	84	71	68	69	35	45	50	31	29	949	
6	Scarlett, T. - - -	14	79	56	79	61	73	348	50	65	86	72	74	68	30	45	35	35	30	938	
7	Robertson, Serjt. C. A.	11	84	58	51	41	55	289	69	67	97	62	81	69	33	55	45	27	30	924	
8	Boughton, Corpl. G. -	12	48	33	50	30	47	208	51	72	80	70	72	71	26	15	30	26	50	771	
9	Weller, Wm. - -	16	61	46	32	32	53	224	46	52	67	59	43	35	16	20	50	29	38	679	

EXAMINATION of the 1st DIVISION of the NORMAL SCHOOL, ROYAL MILITARY ASYLUM, in June 1862.

	Maximum Marks -	—	100	100	100	100	100	500	100	100	100	100	100	100	50	75	50	50	50	1375	
	Minimum Marks -	—	50	50	50	50	50	250	50	50	50	50	50	50	25	37	25	25	25	687	
1	Clarke, P. H. P. -	15	93	67	81	94	68	403	93	75	90	70	80	80	38	35	27	44	—	1035	
2	Hall, A. - - -	21	89	75	77	79	60	380	84	70	75	85	75	70	38	25	24	25	38	989	
3	Condon, P. - - -	19	93	84	83	60	54	374	37	85	80	75	85	90	35	25	25	22	45	978	
4	Loftus, M. - - -	11	82	78	70	69	52	351	79	60	75	60	75	70	38	15	15	18	40	896	
5	Mottram, H. - -	20	79	57	76	39	72	323	91	60	75	65	55	65	35	20	27	28	45	889	
6	Atkinson, C. W. -	13	81	30	73	24	42	250	81	70	85	90	65	75	40	5	50	10	48	869	
7	Willsher, J. - -	12	88	41	76	25	31	261	96	50	80	85	70	80	23	10	30	14	50	849	
8	Ayling, H. - - -	17	86	66	56	33	38	279	62	75	70	80	75	75	23	15	35	26	30	845	
9	Revell, Serjt. N. -	18	84	54	62	24	45	269	56	65	60	80	80	70	38	20	45	10	50	843	
10	Gillmour, Serjt. D. G.	10	52	17	54	47	43	213	72	50	65	75	80	80	25	40	20	29	30	779	
11	Hoskins, S. - - -	14	61	60	78	56	56	311	58	45	70	55	50	60	30	20	33	10	29	771	
12	Mills, Serjt. P. - -	16	82	54	37	28	49	250	77	60	65	75	60	70	25	15	27	28	10	762	

Examination of the 1st Division of the Normal School, Royal Military Asylum, in December 1862.

Order of Merit.	Names.	Index Number.	Arithmetic.	Algebra.	Euclid.	Logarithms and Trigonometry.	Mechanics.	Total.	Scripture History.	English Grammar.	Geography.	History.				Chemistry.	Drawing.	Fortification.	Vocal Music.	Total.	Remarks.
												English.	Roman.	Grecian.	Colonial.						
	Maximum Marks -	—	100	100	100	100	100	500	100	100	100	100	100	100	50	75	50	50	50	1375	
	Minimum Marks -	—	50	50	50	50	50	250	50	50	50	50	50	50	25	37	25	25	25	687	
1	Grant, Corporal J. -	15	74	49	88	37	79	327	100	100	99	98	95	100	42	30	34	35	48	1108	
2	Short, T. - - -	14	100	81	82	59	71	393	85	76	87	87	67	86	42	10	36	50	50	1069	
3	Williams, D. - -	13	69	55	80	53	61	318	95	72	80	94	96	98	41	20	30	34	39	1017	
4	Bell, J. - - -	26	88	56	57	52	89	342	85	72	94	93	62	70	36	45	32	30	48	1009	
5	Wilson, C. - - -	18	76	59	60	59	70	324	90	83	77	56	61	84	32	15	38	41	50	951	
6	Higgins, D. - - -	10	68	48	93	48	57	314	87	85	71	65	62	65	48	25	50	32	35	939	
7	Porter, J. - - -	25	59	36	55	48	62	260	87	86	87	74	72	68	23	30	36	37	50	910	
8	Boland, Serjt. J. -	17	66	38	65	33	69	271	56	75	70	52	87	100	43	40	35	19	42	890	
9	Sessford, J. - - -	12	67	43	52	46	80	288	89	54	71	67	75	71	33	30	36	—	43	857	
10	Perkins, J. - - -	11	68	44	49	30	65	256	92	58	58	76	64	64	32	15	47	34	45	841	
11	M'Rae, Corporal C. -	23	65	31	55	36	47	234	75	72	89	73	76	100	16	10	34	—	44	823	
	Pither, J. - - -	19	70	44	41	54	70	279	75	74	77	49	49	65	30	10	50	20	45	823	
13	Kavanagh, J. J. - -	27	65	56	57	31	70	279	60	74	83	59	48	49	22	25	45	18	48	810	
14	Spong, G. - - -	21	79	37	50	43	54	263	62	66	71	57	45	44	27	20	50	44	50	799	
15	Ogg, G. - - -	16	58	36	49	29	36	208	76	79	68	58	78	78	21	10	35	32	44	787	
16	Powell, J. G. - -	24	74	42	48	44	65	273	73	73	74	55	48	40	23	25	33	29	40	786	
17	Coughlan, Serjt. J. -	22	79	39	54	46	56	274	58	71	67	54	48	63	17	20	40	31	38	781	
18	Morgan, W. G. - -	20	65	33	30	41	55	224	64	89	80	58	21	28	31	45	36	28	48	752	
19	Morgan, Serjt. T. -	28	58	37	67	34	63	259	75	75	69	32	63	47	24	15	40	24	—	723	

Examination of the 1st Division of the Normal School, Royal Military Asylum, in June 1863.

Order of Merit.	Names.	Index Number.	Arithmetic.	Algebra.	Euclid.	Logarithms and Trigonometry.	Mechanics.	Total.	Scripture History.	English Grammar.	Geography.	History.				Chemistry.	Drawing.	Fortification.	Vocal Music.	Total.	Remarks.
												English.	Roman.	Grecian.	Colonial.						
	Maximum Marks -	—	**100**	**100**	**100**	**100**	**100**	**500**	**100**	**100**	**100**	**100**	**100**	**100**	**50**	**75**	**80**	**50**	**100**	**1455**	
	Minimum Marks -	—	**50**	**50**	**50**	**50**	**50**	**250**	**50**	**50**	**50**	**50**	**50**	**50**	**25**	**37**	**40**	**25**	**50**	**727**	
1	Bingham, J. - -	12	99	81	98	87	99	464	98	80	85	70	80	70	35	60	60	37	85	1224	
2	Annett, E. - - -	11	88	73	95	66	83	405	100	70	80	75	70	75	40	40	65	50	100	1170	
3	Hayes J. J. -	10	70	44	75	55	70	314	58	40	65	60	50	70	30	15	70	32	70	874	

Examination of the 1st Division of the Normal School, Royal Military Asylum, in December 1863.

	Maximum Marks -	—	**100**	**100**	**100**	**100**	**100**	**500**	**100**	**100**	**100**	**100**	**100**	**100**	**50**	**75**	**80**	**50**	**50**	**1405**	
	Minimum Marks -	—	**50**	**50**	**50**	**50**	**50**	**250**	**50**	**50**	**50**	**50**	**50**	**50**	**25**	**37**	**25**	**25**	**25**	**687**	
1	Proffatt, Corporal J. -	10	86	83	90	96	99	454	96	100	98	67	95	100	47	60	65	38	45	1265	
2	Walters, R. - - -	22	61	60	78	73	67	339	78	87	86	52	80	80	38	40	78	42	100	1100	
3	Hall, W. - - - -	14	81	74	69	92	78	394	75	77	81	65	68	69	29	35	46	29	15	983	
4	Smith, Corporal T. -	16	44	66	57	59	46	272	94	80	97	82	95	65	26	35	42	22	70	980	
5	Finnigan, E. - - -	20	36	51	61	43	48	239	68	72	100	65	54	50	41	50	79	30	90	938	
6	Hanley, W. - - -	17	33	61	66	60	59	279	60	90	95	58	39	56	33	35	60	24	75	904	
7	Lanning, H. - - -	23	60	67	85	69	59	340	61	59	74	51	80	46	30	30	44	14	70	899	
8	Pollard, J. - - -	18	34	65	65	65	54	283	71	78	91	78	68	49	30	10	50	27	60	895	
9	Rix, W. - - - -	11	64	68	63	70	77	342	42	62	82	50	62	75	20	10	48	36	60	889	
10	Wright, J. - - - -	12	29	58	40	70	61	258	75	63	87	56	61	73	32	20	30	25	95	875	
11	M'Phee, Corporal J. -	13	38	65	53	49	62	267	56	79	79	70	67	85	38	30	55	38	—	864	
12	Carr, J. - - - -	21	44	55	68	46	51	264	69	66	71	52	68	41	32	45	55	28	60	851	
13	Jones, J. - - - -	15	36	62	65	65	24	252	93	48	76	55	57	57	21	40	50	18	50	817	
14	Armstrong, R. - - -	19	40	51	47	34	60	232	61	69	68	43	51	51	11	25	40	32	55	738	
15	Pell, R. - - - -	24	34	57	52	59	27	229	49	38	51	46	29	24	27	20	70	21	50	654	

App. XIII. No. 4.

Appendix XIII.—No. 4.

Royal Military Asylum, Normal School.—December 1863.

Arithmetic and Mensuration.

Rev. Canon Heaviside, M.A.

1. Find the price of 1 cwt. 3 qrs. 5 lbs. at 2*s.* 4¾*d.* a pound.

2. An engine of 31 horse power draws a train at the rate of 37 miles 352 yards an hour, at what rate would the train be drawn by an engine of 35 horse power?

3. If eight burners consume 960 cubic feet of gas burning six hours every evening for five days, in how many days will 11,520 cubic feet be consumed by 12 burners which are lighted for eight hours each evening?

4. In what time will 712*l.* 10*s.* amount to 1,136*l.* 8*s.* 9*d.* at 3½ per cent. simple interest?

5. What must be the market value of 3 per cent. stock so that after deducting the income tax of 7*d.* in the pound it may yield 3½ per cent. interest on investments?

6. What do the numerator and denominator of a vulgar fraction represent? Show that if two proper fractions are multiplied together the product will be less than either of them. Multiply $(\frac{1}{2} + \frac{3}{4} + \frac{5}{8})$ by $(\frac{8}{10} + \frac{8}{100} + \frac{8}{1000})$; and express the multiplier and multiplicand and product as decimals.

7. Find $(\cdot 06)^3$ and divide the result by $(\cdot 002)^2$. Find the side of a square which is equal to the rectangle whose sides are respectively 25 feet and 6·4009 feet.

8. The diagonals of a quadrilateral figure are 750 and 860 feet respectively, and they cut each other at an angle of 30°, find the area of the quadrilateral.

9. A pyramid has a regular hexagon for its base with 20 feet in a side, the height of the pyramid is 50 feet; find its surface not including the base. How must the pyramid be cut by a plane parallel to the base that the content of the upper portion may be $\frac{1}{8}$ of the whole pyramid?

Euclid.

Rev. Canon Heaviside, M.A.

1. Define a right angle, and show that the angles which one straight line makes with another straight line on one side of it, are either two right angles or are together equal to two right angles.

2. Parallelograms upon the same base, and between the same parallels, are equal to each other. Show that a rectangle has the least perimeter of all parallelograms on a given base, and between the same parallels.

3. If a straight line be divided into any two parts, the square of the whole line is equal to the squares of the parts and to twice the rectangle contained by the parts.

What rule in arithmetic is founded upon a property of numbers analogous to this geometrical property.

4. Divide a straight line into two parts, so that the rectangle contained by the whole line and one of the parts shall be equal to the square of the other part.

5. If a point be taken within a circle from which there fall more than two equal straight lines to the circumference, that point is the centre of the circle.

6. In equal circles if the angles at the centres are equal, the circumferences on which the equal angles stand will be equal also.

ABC is an equilateral triangle inscribed in a circle, bisect the arc BC in O, prove the angle BCO equal to half an angle of the triangle.

7. Inscribe a circle in a given triangle.

ABC is a triangle, produce AB to E, show that the lines bisecting the angles ABC, and CBE, are at right angles to each other.

8. Inscribe an equilateral and equiangular pentagon in a given circle.

Algebra.

Rev. Canon Heaviside, M.A.

1. Reduce to its simplest form

$(a+b+c)\,.\,(a+b-c)-(a-b+c)\,.\,(b+c-a)$.

2. Divide $(x+y)^3+z^3$, by $(x+y+z)$.

3. Reduce to its lowest terms $\dfrac{6a^2-13ax+6x^2}{10a^2-9ax-9x^2}$

4. Solve the following equations,

(1) $\dfrac{45}{2x+3}=\dfrac{61}{4x-3}$

(2) $\dfrac{7+x}{5}-\dfrac{2x-y}{4}=3y-5$

$$7y-\frac{13x}{3}=1$$

(3) $\sqrt{x^5}-\dfrac{40}{\sqrt{x}}=3x$.

5. What number is that which being multiplied by the sum of its two digits the product is 1,012, and if 63 be subtracted from the number the digits will be inverted.

6. Find the square root of

$$a^3-4a^2+2a^{\frac{5}{2}}+4a-4a^{\frac{1}{2}}+1.$$

7. In what progression are the quantities $a-2b$, $a-4b$, $a-6b$; find the $(n)^{\text{th}}$ term of this series.

Insert 6 arithmetic means between 9 and $-\frac{3}{2}$, and show that the sum of five terms of this series, beginning with 9, is the same as the sum of eight terms.

8. Find a general expression for the number of combinations of (n) things taken two at a time.

If the company of a regiment contain 64 Englishmen and 30 Scotchmen, how many different guards of three men can be formed in which there is always one Scotchman.

9. Expand $\left(x-\dfrac{1}{x}\right)^6$. Find the sixth term of $(a^2-x^2)^{-\frac{1}{2}}$.

Logarithms and Plane Trigonometry.

Rev. Canon Heaviside, M.A.

1. In the common system of logarithms, determine without the tables, the number of which ·5 is the logarithm. Of what number is (-5) the logarithm? Given $\log_{10}2=\cdot301030$ find $\log_{10}\cdot0125$.

2. Find by the aid of the tables

(1) $(35\cdot746)^{\frac{2}{3}}$

(2) The 9^{th} term of $1+\left(\dfrac{21}{20}\right)+\left(\dfrac{21}{20}\right)$ + &c.

APP. XIII. No. 4.

3. Define the cosine of an angle, write down the values of (1) cos 180°; (2) cos 270°; what is the sign of the cosine from 270° to 360°;

Prove (1) $\cos A = -\cos(180 - A)$.

(2) $\cos 60° = \frac{1}{2}$.

(3) $\tan(45 + A) \times \tan(45 - A) = 1$.

4. Prove (1) $\cos 2A = (\cos A)^2 - (\sin A)^2$.

(2) $$\cot(A + B) = \frac{\cot A \cdot \cot B - 1}{\cot A + \cot B}$$

(3) $$\frac{a}{b} = \frac{\sin A}{\sin B}$$ in any triangle.

5. Given three sides of a triangle, show how to find (1) one angle; (2) the area of the triangle.

6. ABC is a right-angled triangle, C the right angle, given $A = 54° 17'$, $BC = 113 \cdot 7$ feet; solve the triangle.

7. ABC is an oblique-angled triangle. Given AC = 345 feet, BC = 232 feet, $A = 37° 20'$; find the third side of that triangle which is the greatest consistently with the above data.

8. AB and AC are railroads inclined at an angle of 45°. A train starts from (A) along AB with a velocity of 25 miles an hour, after half an hour's interval, a train starts from (A) along AC with a velocity of 30 miles an hour; find the distance of the two trains from each other, three hours after the first train has started.

9. A circle has a diameter of 50 feet, ABCD is a quadrilateral inscribed in the circle. Given AB = 30, BC = 40, CD = 45; find AD.

MECHANICS.

Rev. Canon Heaviside, M.A.

1. How is work measured? What is the measure of a horse power?

An engine is required to raise a weight of 13 cwts. from a depth of 280 fathoms in three minutes, required the horse power of the engine.

2. What is meant by the modulus of a machine?

The diameter of the piston of a steam engine is 60 inches, it makes 11 strokes per minute, the length of each stroke is 8 feet, the mean pressure per inch is 15 lbs.; if the modulus of the engine be ·65, determine the number of cubic feet of water it will raise per hour from a depth of 50 fathom.

3. The mean section of a stream is 8 feet by 1 foot, its mean velocity is 40 feet per minute, it has a fall of 17½ feet, it is required to raise water to a height of 300 feet by means of a water-wheel whose modulus is ·7; how many cubic feet will it raise per minute?

4. A tank resting on the ground has a horizontal square section of 30 feet in a side, the height of the tank is 20 feet, it is to be filled with water from a well, and the surface of the water is 40 feet below the ground, find the work done in filling the tank.

5. What kind of lever is (1) the oar of a boat, (2) a pair of fire-tongs, (3) the treddle of a lathe? Is there a mechanical advantage in all the above cases.

State generally the condition of equilibrium of a lever.

On a lever 12 inches long, 30 ounces at one end balances 90 ounces at the other, where must the fulcrum be placed (1) when the lever is without weight, (2) when it weighs 20 ounces.

6. State the condition of equilibrium (1) on a wheel and axle, (2) on a single moveable pulley with the strings parallel.

On a wheel and axle the radius of the axle is 5 inches, the weight supported is 10 cwt.; what must be the radius of the wheel that the supporting weight shall be 224 lbs.?

7. How is accumulated work measured? what is the measure of the force of gravity? and how are the velocities of falling bodies measured?

A train of 50 tons is moving along a horizontal road at the rate of 17·5 miles an hour, when the steam is suddenly turned off; how far will the train run if the whole resistance be 8 pounds per ton?

8. Define specific gravity. If a body be immersed in water how much of its weight will be lost?

A body (A) weighs 8 ounces in a vacuum; it weighs 6 ounces when immersed in water; what is its specific gravity?

9. Define the centre of gyration of a material body.

Two balls connected by a rod weigh respectively 3 pounds and 4 pounds, the distance of the less from the vertical axis of rotation is 8 feet and of the greater 5 feet, find the radius of gyration of the balls.

English Grammar.

W. Stebbing, Esq., M.A.

1. Explain the terms, *common, proper, collective, abstract,* and *complex* nouns. Give an instance of each.

2. Explain the terms, *objective case*, and *possessive case.* Account for the possessive termination *'s.*

3. How do the forms, *what, which, whether*, and *whose, of which,* differ in use? Give illustrations.

4. Write down the first person of the *future perfect, present perfect, pluperfect,* and *past imperfect* tenses of the verb to *strike.* Explain why these tenses are so named.

5. When are inverted commas, colons, new paragraphs, parentheses, and italics, respectively used? Give instances.

6. How do you form the plural of *Lord Commissioner, Court-Martial, Henry, Miss Smith, spoonful, erratum,* and *species?* Give, if you can, a reason for each formation.

7. Account for the use of the plural, in—"The crowd run"—"He and his cousin are of the same disposition"—"Wilt thou be friends with me?"—And of the singular, in—"The brother and partner of James was there"—"Either they or I am wrong"—"*Halcyon days* is a poetical expression."

8. Are the following sentences correct or incorrect?—"He is a great deal better than us three"—"Socrates was wiser than all the Athenians"—"Good, my Lord, vouchsafe me a word"—"I have read about Milton's the poet's early career"—"Issachar was situated between Zebulon, Manasseh, and the Jordan."

English History.

W. Stebbing, Esq. M.A.

1. Write a life of King Henry VIII.

2. Account briefly for the deposition of Edward II., Richard II., and James II.

3. Give the date of the accession of each *King*, since the Conquest, who was not son, grandson, or brother to his immediate predecessor.

4. With what events, in English History, are the names of Barnet, Beachy Head, Salamanca, Killiecrankie, Camperdown, and Dunkirk found in connexion?

5. Write a life of the first Duke of Marlborough.

6. How many different parties were there in England during the reign of Charles I.? Name one or two of the chief men in each party.

7. Mention shortly the circumstances which led to hostilities between Scotland and England, in the reigns of Stephen, Edward I., Henry VIII., and Edward VI.

App. XIII. No. 4.

8. State shortly the causes of our war with France, in the reign of Mary I.; with Spain, in the time of Queen Elizabeth, and of George II.; and with Holland, during the Commonwealth.

Geography.

W. Stebbing, Esq., M.A.

1. Explain the geographical terms, *cardinal points, first meridian, prairie, archipelago, roadstead, watershed, basin of a river.* Give illustrations.

2. Name the chief ranges of hills in England and Wales, the counties through which they respectively extend, and the (one) highest elevation in each.

3. Through what counties flow the Tyne, Usk, Forth, Suir, and Liffey?

4. Enumerate the principal harbours of Great Britain and Ireland; and mention circumstances which make any of these ports particularly important.

5. Specify the chief natural and manufactured productions of France, Belgium, and Holland respectively.

6. What States border upon Bohemia, Baden, Afghanistan, Tibet, Virginia, Mexico?

7. In what States are Rosetta, Bankok, Quito, Nangasaki, Gondar, Nauplia, Pittsburg, Silistria, Altona, Breslau, Namur, Dantzic?

8. Name and describe the general direction of the principal rivers and ranges of mountains in Hindoostan.

Roman History.

W. Stebbing, Esq., M.A.

1. State very briefly the origin and issue of the Numantine, Jugurthine, Servile, and Piratic wars.

2. In what wars were fought the battles of the Regillus, Sentinum, the Siris, Pydna, Aquæ Sextiæ, Orchomenus? Name the Commanders.

3. Describe shortly four or five famous political prosecutions at Rome.

4. What were the principal subjects of controversy between the patrician and plebian orders, prior to the time of Marius and Sulla?

5. State the circumstances which led to the first Punic war, the Social war, and the Civil war between Pompey and Cæsar.

6. Enumerate the several wars waged by Rome in Spain.

7. Relate the acts, and compare the characters of Julius Cæsar and Augustus.

History of Greece.

W. Stebbing, Esq., M.A.

1. Write lives of Miltiades and Themistocles.

2. Write short accounts of any four or five Asiatics, whose names occur prominently in Greek history.

3. What were the causes and results of the several sacred wars?

4. Relate the acts of Lysander, Conon, and Demetrius, the son of Antigonus.

5. What important events occurred at Coronea, Amphipolis, Chœronea, Ipsus, Sphacteria, Issus?

6. On what occasions do you find especial mention made of Argos, Egesta, Epidamnos, Platæa, Olynthos?

7. Account for the side which the principal allies of Athens and Sparta, in the Peloponnesian war, severally took.

8. During what periods were the Thebans, Spartans, Achæans, Macedonians, and Athenians, respectively, predominant in Greece?

Indian and Colonial History.

W. Stebbing, Esq., M.A.

1. Name the British dependencies in Europe; and state how they severally came into our possession.
2. What territories now belong to us on the American continent? By what means were they severally acquired?
3. How, and when did Assam, Aden, Candy, Jamaica, and Penang become British possessions?
4. Compare, with reference to soil and climate, and general resources, the Australian Settlements. How are they governed?
5. Write lives of Clive and Warren Hastings?
6. Who were Hyder Ali and Tippoo Sultan? Give some account of our wars against those Princes.
7. Describe the incidents of the campaigns in Afghanistan between 1839 and 1842. How did the war originate?
8. When, and by what commanders, were the Sikhs conquered? Give the names and dates of the battles fought against them.

Scripture.

Rev. G. W. Langmead, M.A.

1. Write down some of the prophecies that our Lord should come of the tribe of Judah, and of the house of David, together with their fulfilment.
2. What request was made by the daughters of Zelophehad, and what allusion is there to this circumstance in the book of Joshua?
3. In which of the tribes were the following places situated: Engedi, Shiloh, Jericho, Hebron, Bethel, Gilgal, Mount Ebal, Mount Gerizim, Golan, Ramothgilead, and Mount Carmel?
4. What passages of the Pentateuch are quoted in the Acts of the Apostles?
5. Relate the conversation that passed between our Lord and the young man who said, "Good Master, what good thing shall I do, that "I may have eternal life?"
6. Explain the following passages:—
(*a*) "Let the dead bury their dead."
(*b*) "I am not come to call the righteous, but sinners to repentance."
(*c*) "We have piped unto you, and ye have not danced, we have "mourned unto you, and ye have not lamented."
(*d*) "My yoke is easy, and my burden is light."
7. Where are the following places situated, and how mentioned in the Acts of the Apostles: Salamis, Iconium, Neapolis, Apollonia, Cenchrea, Trogyllium, Miletus, Patara, Ptolemais, Myra, and Clauda?
8. Mention all the circumstances that took place during the time that St. Paul was detained at Melita.

Field Fortification.

1. What are the defensive works in field fortification?
2. What height is usually given to the parapet, and when may a greater or less height be given?
3. What is meant by defilading a work?
4. How would you calculate the length of the side of a square redoubt, capable of containing a given number of men and guns?
5. What is the objection to *redans* as field works, and under what circumstances may they be advantageously employed?

App. XIII. No. 4.

Permanent Fortification.

1. Why are some parts of a fortification made salient, and other parts re-entering?

2. What does a front of fortification consist of, and what name is given to the inner enclosure?

3. What are outworks, and name those in Vauban's First System?

4. What length did Vauban usually give to the exterior side, and why may it be made longer now than in his time?

5. Supposing the relief of the bastion to be made greater than that given to it by Vauban, would it be necessary to make any difference in the length of the exterior side?

Chemistry.

F. A. Abel, Esq., F.R.S.

1. How would you demonstrate the proportion of nitrogen existing in air? Do you regard atmospheric air as a compound or a mixture? Give reasons for your statement.

2. What do you know regarding the origin and mode of formation of coal? What are the principal varieties of coal, and in what important respects do they differ from each other?

3. How is coal-gas produced? Of what gases is it principally composed? State to what constituent it owes its luminosity, and give the grounds upon which your statement is based.

4. 50 grains of each of the under-mentioned substances are burned in oxygen; what are the quantity, name, and composition, expressed in symbols, of the product obtained in each case? *Phosphorus Eq.* 31, *Sodium* 23, *Iron* 28, *Sulphur* 16, *Carbon* 6.

5. Give an account of the modes of preparing the gases required to exhibit the lime light. State in what proportions they are used, and point out the principle upon which the arrangements are based for their safe employment together.

6. In what forms does nitric acid occur in nature? How is it prepared for commerce? What are its composition and characteristic properties?

7. Describe, by means of symbols, the production of protoxide of nitrogen, by the action of heat upon nitrate of ammonia; and the production of binoxide of nitrogen, by the action of nitric acid upon copper (Cu.). Point out the characteristic properties of each of those gases.

8. What is the ordinary product of combustion of sulphur in air or oxygen? Describe its nature and properties, and give some account of the manner in which it is made instrumental to the production of sulphuric acid.

9. What are the name and properties of the gas obtained by adding sulphuric acid to a mixture of common salt and binoxide of manganese? Show in an equation how it is produced.

10. With what important compound of nitrogen and hydrogen are you acquainted? How would you obtain it in the gaseous form, and by what properties would you recognize it?

Music.

G. W. Martin, Esq.

1. Give an example of the different kinds of scales you are acquainted with.

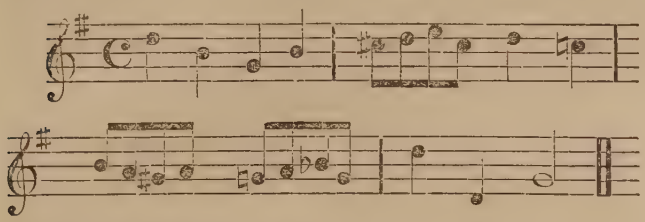
2. Explain briefly the mode of training the ear to distinguish between one sound of the scale and another.

3. Give notes of a lesson on the mode of representing the pitch and duration of sounds to the eye, and explain the difference between singing at sight and singing by ear.

4. Gives notes of a lesson on accent.

5. Write out six measures of time, each measure to have a different value in notes, add the time signature in each case, and explain the particulars of accent in each measure.

6. Transpose the following passage to the scale of F.



7. Give an example of modulation.

8. What is the difference between a diatonic and chromatic interval? Write out a diminished, minor, major, and augmented third—invert them, and state what change takes place in their character by inversion.

Appendix XIII.—No. 5.

Report by Canon Moseley on the Model School of the Royal Military Asylum, Chelsea.

Royal Military Asylum, Chelsea, Midsummer, 1863.

The school is taught in five divisions, the numbers of boys in which respectively are,—

1st Division	- - -	- 81
2nd „	- - -	- 91
3rd „	- - -	- 79
4th „	- - -	- 85
5th „	- - -	- 163
	Total -	- 499

There is a master for each division, and to assist the masters there are 20 monitors.

The monitors are admitted by competitive examination at the age of 16; some of them have been boys of the Royal Military Asylum. The monitors leave the school about the age of 18.

If found competent they have been accustomed to go out as 4th class regimental schoolmasters, returning after about three years to complete their education in the normal school, and to become 3rd class schoolmasters.

Five of the monitors were at the time of my inspection of the school prepared to enter on the duties of 4th class schoolmasters. That class of schoolmasters having, however, been abolished, it is proposed that these youths should remain in the school, where they will be a kind of assistant masters.

App XIII. No. 5.

Besides the masters and monitors the students of the training school who are in the last half year of their residence also work in the model school, where it is their business to acquire the art of teaching, and with that view they practice it under the eye of Mr. McLeod, the master of the 1st division, and head master of the school, who is eminent as an elementary teacher, and whose business it is to teach them to teach. If these students, who are constantly occupied in the school, be included among the teachers, the total number of teachers at the time of my inspection was five masters, 20 monitors, 19 students, being one teacher * to every 11 boys.

The time-table of the school is that sanctioned by the Commander-in-Chief, on the recommendation of the Council of Military Education. I enclose a copy, p. 175.

The time-table has been strictly kept to, and is said to have worked well.

The recommendation of the Council that the boys should go on half holidays to Battersea Park has been acted upon this half year in only two instances. One of the officers of the Asylum, the chaplain, and the head master accompanied them.

The religious instruction is given partly by the chaplain and partly by the masters. The chaplain instructs the boys in the Catechism, and the masters in the historical parts of the Holy Scriptures. The lessons of the masters in the Holy Scriptures are given daily; those of the chaplain in the Catechism once a week. The boys all attend Sunday school for an hour in the evening. They are taught by the masters.

It is impossible to have visited the schools frequently and not (I think) to be struck with the smallness in stature of the boys for their age, and by a certain appearance of physical depression and debility which runs through the school, but shows itself most perhaps in the 1st division.

To arrive at some well-grounded conclusion in this respect, I ascertained the weights and heights of 30 of the boys who had last left the Asylum on attaining 14 years of age, from a register kept by the medical officer. I ascertained also the weights and heights of 30 boys of the age of 14 (and of the same class socially) in the Greenwich Hospital schools, through the kindness of the Rev. G. Fisher, F.R.S., the Principal of those schools; I append these returns to my reports.† It appears from them that the average stature of a boy of 14 in the Greenwich schools is 4 ft. $8\frac{9}{10}$ in.,‡ and of a boy in the Royal Military Asylum of the same age, 4 ft. $6\frac{7}{10}$ in., and that the average weight of a boy of 14 without his clothes in the Greenwich schools is 75 lb. 2 oz., and that of a boy in the Royal Military Asylum, 71 lb. 14 oz., so that a boy of 14 in the Greenwich schools is on the average $2\frac{2}{10}$ inches taller, and 3 lb. 4 oz. heavier than one of the same age at the Royal Military Asylum.

These facts suggest inquiries such as the following:—

1. Are the dormitories of sufficient height for ventilation, and is there sufficient space for the air to enter and escape?
2. Is the food of the boys what it ought to be in respect to quality?
3. Is it properly cooked?
4. Does each boy have enough, especially the elder boys?
5. Have the boys sufficient leisure from school and industrial work and drill, and are they taken out from the precincts of the Asylum to the neighbouring parks or elsewhere as often as is possible or expedient?

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* The students are however considered supernumeraries.

† Pp. 182, 183.

‡ These boys were all the sons of common sailors taken otherwise without selection.

Hearing that Dr. Balfour, formerly the resident medical officer of the schools, had given special attention to some of these questions, I sought an interview with that gentleman. He detailed to me the improvements he had introduced in the dietary of the boys, and in the ventilation of the dormitories (consequent in some degree, he said, on a report I had myself made on the schools 15 years ago), and he expressed so firm a conviction of the efficacy of those changes, and of the present satisfactory state of the schools, both as to diet and ventilation, that I cannot attribute to these causes the physical inferiority of the boys of the Royal Military Asylum to others of their own age.

It remains to consider whether the site is a proper one in which to collect 500 boys. It is near the river; it is low; it is surrounded by a low population; and the impurity of the air from smoke and dust is shown by the dirtiness of the hands and faces of the boys, notwithstanding that they are frequently washed. The associations of the locality are bad for the boys, and especially for the students of the normal school.

There can be little doubt that the school would be *better* placed for health (and for other considerations) in the *country*, on high ground and a dry soil.

The present site of 10 acres, valued at half the price per acre at which that of the Kensington Museum is valued, would perhaps sell for about 75,000*l.* The erection of new school buildings would not cost probably more than 100*l.* per boy,* or 50,000*l.* of this sum. The remaining 25,000*l.* would perhaps be enough for the purchase of a new site where land is cheap (as, for instance, in the neighbourhood of the Wellington College), and for erecting the buildings of the normal school.

I commenced my examination on Monday the 8th June, and continued it through the week.

Reading.

The boys of the first division read in the 1st and 2nd books of Milton's Paradise Lost. They learn to understand what they read by notes printed at the bottom of each page, and by being taught that kind of grammar which is called the "analysis of sentences."

The intelligence they have of Milton is, I think, very remarkable. Their *reading* does not however seem to me so good as it was when last I examined the school. There is not the same justness of expression as I had before observed, or attention to the rythm.

The reading of the lower divisions of the school appears to me to be carefully taught.

I made a note of the reading of every boy of the third division, classing it in three sections according to accuracy, represented by A., B., C. I found as follows:—

Reading of Division III.

——	A.	B.	C.
Class 1 - -	13	8	6
Class 2 - -	7	12	6
Class 3 - -	6	11	7

* The price at which County Lunatic Asylums are erected is about 100*l.* per inmate.

App. XIII. No. 5.

Each of the classes read in its ordinary reading-lesson book, which was a harder book in class 1 than class 2, and in class 2 than class 3, so that the letters A., B., C. are not to be understood as representing the same standards of reading in all.

The fifth division is a very large one, composed of very young boys, or of boys only recently admitted to the school. It is under the care of Mr. Dexter, a master of great experience and known ability. The first class, composed of 33 boys, read and spell well for their age, and show a good intelligence of what they read. The reading of the second class was not so good, and, on the whole, I am not disposed to think the reading of the boys generally in the school so good as I think I have on some former occasions found it.

Writing from Dictation.

I enclose a specimen of the writing from dictation of the 1st, 2nd, and 3rd classes of division I., and of the 1st classes of divisions II. and III. respectively. These were written in my presence, from the dictation of one of the masters. I think them very creditable specimens of penmanship, and the accuracy of the spelling is remarkable.

Arithmetic.

The following were the sums I set to the different divisions and classes of the school; opposite to each I have stated the number of boys who worked it correctly:

Division I.

1st Class. (Number of boys, 27.)

1. Find the value of 3·45 of 5 guineas. Right, 19; wrong, 8.
2. Find the amount of 575*l.* for $8\frac{3}{4}$ years at $3\frac{3}{8}$ per cent. interest.* Right, 16; wrong, 11.

2nd Class. (26 boys.)

1. Bring to a common denominator $2\frac{1}{6}$, $\frac{3}{4}$, $\frac{1}{8}$, $\frac{1}{15}$, $\frac{1}{27}$. Right, 19; wrong, 7.†
2. Multiply 32·16 by 22·5. Right, 24; wrong, 2.
3. If 7 men can mow 84 acres in 12 days of $8\frac{1}{4}$ hours each, how many acres can be mowed by 20 men in 11 days of $7\frac{1}{2}$? Right, 17; wrong, 9.
4. Find the value of 2 cwt. 4 lb. 12 oz. at 3*l.* 1*s.* per cwt. Right, 13 wrong, 14.

N.B. The ages of the boys in the above 2nd class were as follows:—

Between 11 and 12	-	-	- 2 boys.
„ 12 and 13	-	-	- 7 „
„ 13 and 14	-	-	- 15 „
„ 14 and 15	-	-	- 2 „

3rd Class. (27 boys.)

1. Divide $\frac{1}{4}+\frac{1}{3}+\frac{1}{20}$ by $\frac{1}{4}-\frac{1}{8}$. Right, 19; wrong, 7.
2. If 7 men can earn 9*l.* 10*s.* 6*d.* in $10\frac{1}{2}$ days, what sum will 20 men earn in $31\frac{1}{2}$ days? Right, 15; wrong, 12.

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* I enclose a copy taken from one of the slates of the way in which this sum was worked.

† All who were wrong were wrong only in *one* fraction.

Division II.

1st Class. (23 boys.)

Add 3,9, $2\frac{1}{15}$, $5\frac{3}{7}$. Right, 11; wrong, 12.
Subtract $1\frac{3}{10}$ from $2\frac{6}{11}$. Right, 10; wrong, 13.

Division III.

1st Class. (27 boys.)

Required the price of 32 sugar loaves, each weighing 7 lb. 8 oz., at 7*d.* per lb. Right, 3; wrong, 24.

Division IV.

1st Class. (28 boys.)

Multiply 106*l.* 17*s.* 7*d.* by 320. Right, 13; wrong, 15.

2nd Class. (28 boys.)

Multiply 806*l.* 11*s.* 10*d.* by 42. Right, 17; wrong, 11.

When the sums were working I took the precaution to divide the boys who usually sit at one group of desks over *two*.

The sums were worked by what are called *first principles*, which is a way of working them not by rules but by reasons or claims to be such.

I consider the arithmetic of these boys to be worthy of high commendation. Indeed, considering the quickness and accuracy with which they work their sums, and the intelligence they have of the methods they use, I doubt whether it is surpassed in any other elementary school. The methods they use are often different, that is, they arrive at the same result by different ways, which they find out each for himself. I have enclosed a copy taken from one of their slates of the working of a question in interest, which will show what is meant by the method of first principles. It is an advantage of this method for the purposes of elementary education, that it exercises the understanding, making of every sum a proposition which is reasoned *out*. Thus it takes the place of Euclid in teaching boys to reason.

Geography and English History.

These subjects are taught in the first four divisions of the school. In the first two special attention is given to the geography and history of the British Empire, and specially of the Colonial Empire.

English Grammar.

Composition and Etymology.

English grammar is taught chiefly by the method known as that of the "analysis of sentences." Of the advantage of which in teaching such boys as these to understand books so difficult to be understood as the "Paradise Lost" I have already spoken.

The exercise of the reason and understanding of the boys on what they read is a necessary condition of this method of teaching. It is, moreover, a good expedient to teach them to write English correctly.

Geometry.

The Manual* used in teaching geometry is not suitable for boys. The text of Euclid has been found by experience better adapted to this end than any other book. The knowledge these boys have acquired of geometry is superficial and inaccurate.

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* It was prepared specially for the use of the school.

App. XIII. No. 5.

Singing.

I heard all the classes sing, and although scarcely competent to form a judgment on the merits of their singing, I think I can testify to a considerable improvement in the last half year. All the boys of the first class are said to be capable of singing separately as well as in chorus, and the same is true of many of the boys of the lower classes. They all sing part music by note, using the manuals of Mr. Martin, who is the music-master of the school. The teaching they receive from him cannot but help that of the band-master, and be of great use to them in the profession of musicians for the army, to which so many of them are destined. It might be made the means, perhaps, of introducing singing more generally in the army.

Mr. Martin has several times expressed to me his wish to establish regimental singing schools in the regiments quartered in and about London.

Model Drawing.

Mr. Kingsley, who sees the drawings of the boys every year, is accustomed to express his high approval of them. Drawing is taught on Friday afternoon to the first division from 2 o'clock to 3.30 in the first class of that division, and from 2 to 3 hours in the second and third classes.

The Ages of the Boys.

The boys all leave the school at 14, except the band boys, who remain until 15.

Of those who being between 13 and 14 are in their last year, there are in the—

I. Division - - - -	43
II. „ - - - -	22
III. „ - - - -	6
IV. „ - - - -	3

The nine boys of this age who are in the III. and IV. divisions may be supposed to represent the incorrigibly dull boys of the school. There are always such in every school. Out of 500 boys of the class to which the boys of the Royal Military Asylum belong, this is far, I think, from being a large proportion.

Punishments.

All punishments for offences out of school are inflicted under the authority of the commandant. Those for offences in school are inflicted by the masters of the several divisions, who are responsible to the head master. They are of three kinds:—

1st. Impositions done out of school hours, but limited to a half hour's confinement.

2nd. Drills inflicted by the military authorities on the requisition of the schoolmasters. Each drill lasts three-quarters of an hour. The limit for any offence is six drills on different days.

3rd. Caning on the hand.

Each master may inflict any of these punishments, but no caning can exceed six blows.

All other blows than blows with the cane are interdicted absolutely. No record is kept of these punishments. The head master thinks, however, that none are inflicted without his knowledge.

In conclusion, I have to acknowledge the courtesy with which whatever inquiries I have made have been answered by the authorities of the Asylum.

I have however felt a difficulty in making such inquiries as to matters under the control of the military authorities. These matters often con-

nect themselves directly with the education of the boys, and may be said to belong to it. It is therefore, I think, to be regretted that there should be any part of the system of the Royal Military Asylum into which it is understood not to be the duty of the Council of Military Education to inquire.

1st July 1863. HENRY MOSELEY.

TIME TABLE.—MODEL SCHOOLS ROYAL MILITARY ASYLUM.

FIRST CLASS.—FIRST SCHOOL.

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
			MORNING.			
9 to 9.30	Bible lesson.	Bible lesson or Old Testament.	Bible lesson.	Bible lesson.	Bible lesson, or New Testament.	Bible lesson.
9.30 to 10	English history.	Composition.	General geography.	Writing -	Composition.	Natural philosophy, ½ of an hour.
10 to 10.30	Grammar (parsing).	I. Euclid, ½ of an hour.	Composition.	Etymology.	Grammar	Arithmetic.
10.30 to 11	Poetry -	I. Algebra, ½ of an hour.	Arithmetic	English history.	Arithmetic	Do. for ½ of an hour.
11 to 11.30	Mental arithmetic.	II. Algebra, ½ of an hour. II. Euclid, ½ of an hour.	Grammar (text book).	Dictation on paper.	British Colonies.	Music. -
			AFTERNOON.			
2 to 2.30	Arithmetic	British Empire.	Vocal music	Arithmetic	Drawing -	Recreation.
2.30 to 3	Write poetry.	Writing -	Do.	I. Algebra II. Euclid	Do.	Do.
3 to 3.30	General geography.	St. Paul's Travels, or Grammar.	Do.	I. Euclid II. Algebra	Do.	Do.

SECOND CLASS.—FIRST SCHOOL.

			MORNING.			
9 to 9.30	Bible lesson, or Writing.	Bible lesson or Writing.	Bible lesson or general geography.	Bible lesson or arithmetic.	Writing -	Bible lesson or Dictation.
9.30 to 10	Grammar	Arithmetic.	Writing -	English history.	Old Testament.	Revise arithmetic.
10 to 10.30	Arithmetic	St. Paul's Travels.	Grammar	Grammar	Arithmetic	Do. for ½ of an hour.
10.30 to 11	Do. for ½ of an hour.	Grammar	Dictation	Writing or composition.	General grapyh.	Colonies and British Empire, alternately.
11 to 11.30	Geometry Do. for ½ of an hour.	English History.	Arithmetic	Etymology with spelling.	Geometry	Vocal music.

App. XIII. No. 5.

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
			AFTERNOON.			
2 to 2.30	Reading Milton.	Composition.	Vocal music	Mental arithmetic.	Drawing -	Recreation.
2.30 to 3	General geography.	Arithmetic	Do.	Learn poetry.	Do.	Do.
3 to 3.30	Composition.	Algebra -	Recreation	Write poetry from memory.	Recreation.	Do.

THIRD CLASS.—FIRST SCHOOL.

MORNING.

9 to 9.30	Bible lesson or mental arithmetic.	Bible lesson or spelling.	Bible lesson or writing.	Bible lesson or writing poetry.	New Testament.	Bible lesson or general geography.
9.30 to 10	Composition.	Old Testament.	St. Paul's Travels.	Arithmetic	Arithmetic	Composition.
10 to 10.30	General geography	Grammar	Arithmetic	Dictation	Colonies -	Geometry.
10.30 to 11	Algebra -	Writing -	British Empire.	Grammar	Writing -	Revise arithmetic.
11 to 11.30	Grammar	Arithmetic	Composition.	English history.	Grammar	Music.

AFTERNOON.

2 to 2.30	Writing or mental arithmetic.	English history.	Vocal music.	General geography.	Drawing -	Recreation.
2.30 to 3	Arithmetic	Geometry.	Do.	Mental arithmetic or tables.	Do.	Do.
3 to 3.30	Learn poetry.	Spelling and etymology.	Recreation	Reading Deserted Village.	Recreation	Do.

FIRST CLASS.—SECOND DIVISION.

MORNING.

9 to 9.30	Bible lesson.	Bible lesson.	Learn poetry.	Bible lesson.	Bible lesson.	Slate arithmetic.
9.30 to 10	Dictation	Composition.	Dictation	Writing -	Dictation	English history.
10 to 10.30	Slate arithmetic.	Slate arithmetic.	Slate arithmetic.	Slate arithmetic.	Slate arithmetic.	Etymology.
10.30 to 11	British Colonies.	Read poetry.	Composition.	British India.	General geography.	British Colonies.
11 to 11.30	Writing.	Mental arithmetic.	Geography, British Empire.	General geography.	Writing.	—

AFTERNOON.

2 to 2.30	Slate arithmetic.	Collective lesson.	Vocal music.	Object lesson.	Reading.	—
2.30 to 3	Mental arithmetic or tables.	Grammar.	Do.	glish history.	Grammar.	—
3 to 3.30	Grammar	Geography, Palestine.	Do.	Etymology	Mental arithmetic	—

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
SECOND CLASS.—SECOND DIVISION.						
MORNING.						
9 to 9.30	Bible lesson.	Bible lesson.	Geography British Empire.	Bible lesson.	Bible lesson.	Etymology.
9.30 to 10	Slate arithmetic.	Slate arithmetic.	Mental arithmetic.	Slate arithmetic.	Slate arithmetic.	Slate arithmetic.
10 to 10.30	Etymology	Dictation	Grammar	Dictation -	Grammar	Dictation
10.30 to 11	Composition.	Writing -	Slate arithmetic.	Writing -	Composition.	English history.
11 to 11.30	English history.	Read poetry.	Writing -	Geography Palestine.	British Colonies.	—
AFTERNOON.						
2 to 2.30	Grammar	Collective lesson.	Vocal music.	Object lesson.	Slate arithmetic.	—
2.30 to 3	Slate arithmetic.	Reading -	Do.	Mental arithmetic.	General geography.	—
3 to 3.30	General geography.	Learn poetry.	Do.	British India.	Spelling -	—
THIRD CLASS.—SECOND DIVISION.						
MORNING.						
9 to 9.30	Bible lesson.	Bible lesson.	Slate arithmetic.	Bible lesson.	Bible lesson.	Write out and learn rules of Syntax.
9.30 to 10	General geography.	English history.	Geography, British Empire.	English history.	General geography.	Mental arithmetic.
10 to 10.30	Composition.	Writing -	Writing -	Writing -	Writing -	Composition.
10.30 to 11	Slate arithmetic.	Slate arithmetic.	Mental arithmetic.	Slate arithmetic.	Slate arithmetic.	Slate arithmetic.
11 to 11.30	Dictation	Dictation	Reading -	Dictation	Dictation	—
AFTERNOON.						
2 to 2.30	Read poetry.	Collective lesson.	Vocal music.	Object lesson.	Etymology	—
2.30 to 3	Grammar	Slate arithmetic.	Do.	General geography.	Mental arithmetic	—
3 to 3.30	Tables -	Spelling -	Do.	Learn poetry.	Grammar	—
FIRST CLASS.—THIRD SCHOOL.						
MORNING.						
9 to 9.30	Bible lesson.	Bible lesson.	English history.	Bible lesson.	Bible lesson.	Writing.
9.30 to 10	Reading -	Reading -	Arithmetic	Composition.	Arithmetic	English history.
10 to 10.30	Arithmetic	Writing -	Geography	Read poetry.	Geography	Spelling.
10.30 to 11	Writing -	Grammar (parsing).	Composition.	Writing -	Writing -	Arithmetic.
11 to 11.30	Mental arithmetic.	Mental arithmetic.	Grammar	Tables -	Mental arithmetic.	Recreation.

App. XIII. No. 5.

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Afternoon.						
2 to 2.30	Composition.	Dictation	Vocal music.	English history or object lesson (collective).	Grammar, rules of Syntax.	Recreation.
2.30 to 3	Grammar	Geography	Do.	Dictation	Arithmetic	Do.
3 to 3.30	Spelling (on slates).	Arithmetic	Do.	Arithmetic	Reading -	Do.

SECOND CLASS.—THIRD SCHOOL

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Morning.						
9 to 9.30	Bible lesson.	Bible lesson.	Writing -	Bible lesson.	Bible lesson.	Grammar (parsing).
9.30 to 10	Writing -	Writing -	English history.	Reading -	Composition.	Writing.
10 to 10.30	Reading Poetry.	Reading -	Arithmetic	Writing -	Reading -	Dictation.
10.30 to 11	Arithmetic	Arithmetic	Geography	Grammar (examination on slates).	Arithmetic	Arithmetic.
11 to 11.30	Dictation	Grammar	Mental arithmetic.	Mental arithmetic.	Dictation	Recreation.
Afternoon.						
2 to 2.30	Geography	Geography	Vocal music	English history or object lesson.	Reading (sacred history).	Recreation.
2.30 to 3	Arithmetic	Composition.	Do.	Composition.	Spelling (on slates).	Do.
3 to 3.30	Grammar	Spelling -	Do.	English history.	Tables -	Do.

THIRD CLASS.—THIRD SCHOOL.

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Morning.						
9 to 9.30	Bible lesson.	Bible lesson.	Grammar (parsing).	Bible lesson.	Bible lesson.	Writing.
9.30 to 10	Geography	Reading -	Writing -	Geography	Reading -	Grammar (examination on slates).
10 to 10.30	Composition.	Writing -	English history.	Composition.	Dictation	English history.
10.30 to 11	Mental arithmetic.	Geography	Mental arithmetic.	Mental arithmetic.	Grammar	Arithmetic.
11 to 11.30	Writing -	Dictation	Dictation	Writing -	Arithmetic	Recreation.
Afternoon.						
2 to 2.30	Spelling -	Read poetry.	Vocal music	English history, object lesson.	Spelling (from black board).	Recreation.
2.30 to 3	Tables -	Tables -	Do.	Reading -	Reading Scripture history.	Do.
3 to 3.30	Arithmetic	Arithmetic	Do.	Arithmetic	Arithmetic	Do.

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
FIRST CLASS.—FOURTH DIVISION.						
MORNING.						
9 to 9.30	Bible lesson.	Bible lesson.	Composition.	Bible lesson.	Bible lesson.	Parsing.
9.30 to 10	Arithmetic	Grammar	Parsing -	Reading -	Grammar	Arithmetic.
10 to 10.30	History of England.	Arithmetic	Arithmetic	Arithmetic	Arithmetic	Physical geography.
10.30 to 1	Writing -	Geography of England.	History of England.	Physical geography.	Geography	Writing.
11 to 11.30	Geography	Writing -	Writing -	Writing -	Writing -	Recreation.
AFTERNOON.						
2 to 2.30	Collective lesson, English history.	Mental arithmetic.	Vocal music	Object lesson.	Tables -	Recreation.
2.30 to 3	Spelling -	Composition.	Do.	Dictation	Reading -	Do.
3 to 3.30	Dictation	Reading poetry.	Recreation	Mental arithmetic.	Transcribing.	Do.
SECOND CLASS.—FOURTH DIVISION.						
MORNING.						
9 to 9.30	Bible lesson.	Bible lesson.	Reading -	Bible lesson.	Bible lesson.	Arithmetic.
9.30 to 10	Grammar	Writing -	Writing -	Writing -	Arithmetic	Spelling.
10 to 10.30	Arithmetic	History of England.	Spelling -	Tables -	Grammar	Writing.
10.30 to 11	Physical geography.	Arithmetic	Arithmetic	Arithmetic	Writing -	History of England.
11 to 11.30	Writing -	Parsing -	Geography of England.	History of England.	Geography	Recreation.
AFTERNOON.						
2 to 2.30	Collective lesson, English history.	Tables -	Vocal music	Object lesson.	Mental arithmetic.	Recreation.
2.30 to 3	Dictation	Geography	Do.	Reading -	Composition.	Do.
3 to 3.30	Reading poetry.	Transcribing.	Do.	Transcribing.	Reading -	Do.
THIRD CLASS.—FOURTH DIVISION.						
MORNING.						
9 to 9.30	Bible lesson.	Bible lesson	Arithmetic	Bible lesson.	Bible lesson.	Writing.
9.30 to 10	Writing -	Arithmetic	Geography of England.	Arithmetic	Writing -	History of England.
10 to 10.30	Geography	Grammar	Writing -	History of England.	Geography	Arithmetic.
10.30 to 11	Arithmetic	Writing -	Reading -	Writing -	Arithmetic	Spelling.
11 to 11.30	Reading -	History of England.	Tables -	Reading -	Grammar	Recreation.

App. XIII. No. 5.

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
			AFTERNOON.			
2 to 2.30	Collective lesson, English history.	Reading -	Vocal music	Object lesson.	Reading -	Recreation.
2.30 to 3	Reading -	Transcribing.	Do.	Tables -	Transcribing.	Do.
3 to 3.30	Transcribing.	Spelling -	Do.	Spelling -	Mental arithmetic.	Do.
			FIRST CLASS.—INFANT SCHOOL.			
			MORNING.			
9 to 9.30	Bible lesson.	Bible lesson.	Object lesson.	Bible lesson.	Natural history.	Natural history.
9.30 to 10	Reading -	Reading poetical book.	Reading -	Reading poetical book.	Reading -	Reading poetical book.
10 to 10.30	Writing in C.B.	Writing on slates.	Writing in C.B.	Writing on slates.	Writing in C.B.	Writing on slates.
10.30 to 11	Mental arithmetic.	Slate arithmetic.	Mental arithmetic.	Slate arithmetic.	Mental arithmetic.	Slate arithmetic.
11 to 11.30	Slate arithmetic.	Do.	Slate arithmetic.	Do.	Slate arithmetic.	Recreation.
			AFTERNOON.			
2 to 2.45	Geography	Reading natural history.	Vocal music	Geography	Reading poetical book.	Recreation.
2.45 to 3.30	Dictation	Arithmetic	Do.	Dictation	Slate arithmetic.	Do.
			SECOND CLASS.—INFANT SCHOOL.			
			MORNING.			
9 to 9.30	Bible lesson.	Bible lesson.	Natural history.	Bible lesson.	English history.	Natural history.
9.30 to 10	Mental arithmetic.	Reading (geography)	Mental arithmetic.	Mental arithmetic.	Mental arithmetic.	Reading.
10 to 10.30	Slate arithmetic.	Dictation	Slate arithmetic.	Slate arithmetic.	Slate arithmetic.	Mental arithmetic.
10.30 to 11	Reading -	Mental arithmetic.	Reading -	Reading -	Reading -	Slate arithmetic.
11 to 11.30	Writing in C. B.	Slate arithmetic.	Writing in C. B.	Writing on slates.	Writing in C. B.	Recreation.
			AFTERNOON.			
2 to 2.30	Slate arithmetic.	Geography	Vocal music	Geography	Reading -	Recreation.
2.30 to 3	Reading -	Reading -	Do.	Reading -	Spelling -	Do.
3 to 3.30	Dictation	Slate arithmetic.	Recreation	Dictation	Dictation	Do.
			THIRD CLASS.—INFANT SCHOOL.			
			MORNING.			
9 to 9.30	Bible lesson.	Bible lesson.	Bible lesson.	Bible lesson.	Bible lesson.	Reading.
9.30 to 10	Reading -	Mental arithmetic.	Reading -	Reading -	Reading -	Writing in C. B.
10 to 10.30	Writing in C. B.	Slate arithmetic.	Writing in C. B.	Writing in C. B.	Writing in C. B.	Mental arithmetic.
10.30 to 11	Mental arithmetic.	Reading -	Mental arithmetic.	Mental arithmetic.	Mental arithmetic.	Slate arithmetic.
11 to 11.30	Slate arithmetic.	Dictation	Slate arithmetic.	Slate arithmetic.	Slate arithmetic.	Recreation.

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
			Afternoon.			
2 to 2.30	Reading -	Reading -	Vocal music	Reading -	Mental arithmetic.	Recreation.
2.30 to 3	Dictation	Dictation	Do.	Dictation	Slate arithmetic.	Do.
3 to 3.30	Slate arithmetic.	Slate arithmetic.	Recreation	Slate arithmetic.	Reading -	Do.

Sums referred to by Rev. Canon Moseley, in foot note to p. 172.

First Class.—Interest.

Question.—Find the amount of 575*l.* for $8\frac{3}{4}$ years at $3\frac{3}{8}$ per cent.

Solution.

Interest on 100*l.* for 1 year $= 3\frac{3}{8}l.$

„ 1*l.* „ $= \frac{3\frac{3}{8}}{100}l.$

„ 575*l.* „ $= \frac{575 \times 3\frac{3}{8}}{100}l.$

„ 575*l.* $8\frac{3}{4}$ $= \frac{8\frac{3}{4} \times 575 \times 3\frac{3}{8}}{100}l.$

$= \frac{7 \times 115 \times 27}{4 \times 4 \times 8} = \frac{21735}{128}l.$

	£	s.	d.
Interest	= 169	16	$1\frac{1}{2}$
Principal	= 575	0	0
Amount	= 744	16	$1\frac{1}{2}$ Ans.

Second Class.—Rule of Three.

If seven men can mow 84 acres in 99 hours, how many acres can 20 men mow in $85\frac{4}{5}$ hours?

No. of acres mowed by 7 men in 99 hrs. $= 84$

„ „ 1 man „ $= \frac{84}{7}$

„ „ „ 1 hr. $= \frac{84}{7 \times 99}$

„ „ 20 men „ $= \frac{84 \times 20}{7 \times 99}$

„ „ „ $85\frac{4}{5}$ or $\frac{429}{5} = \frac{12 \times 4 \times 13}{1 \times 33}$

Ans., 208 acres.

No. of acres mowed by 7 men in 99 hrs. $= 84$

„ „ 1 man „ $= \frac{84}{7}$

„ „ „ 1 hr. $= \frac{84}{7 \times 99}$

„ „ 20 men „ $= \frac{20 \times 84}{7 \times 99}$

„ „ $5\frac{4}{5}$ or $\frac{429}{5} = \frac{13 \times 4 \times 4}{1 \times 1 \times 3}$

$= 13 \times 4 \times 4$

$= 208$ acres, Ans.

App. XIII. No. 6.

Appendix XIII.—No. 6.

Royal Military Asylum, Chelsea.

Return of the Height and Weight of the last 30 Boys who have left the Asylum at the age of 14 years.

Names.	Height.		Weight.	Remarks.
	Ft.	In.	lbs.	
Carroll, William J.	4	4	60	
Irvine, Thomas William	4	8	101	
Wilson, Henry Mark	4	10 3/4	86	
Neal, James	4	7 3/4	71	
Jackson, Samuel James	4	7	77	
Shaw, Andrew	4	3 1/2	66	
Sheridan, John	4	5 3/4	68	
Watkins, Edwin	4	8	78	
Higgs, Robert	4	3 1/2	62	
Robinson, Samuel	4	7	63	
Cockburn, Robert Henry	4	6 1/2	66	
Steele, William	4	8 1/2	79	
Kendall, George A.	4	7 3/4	70	
Monaghan, J. N. J.	4	2 1/4	67	
Negus, John W.	4	11 1/2	77	
Magill, William Frederick	4	4 1/4	70	
Hunt, William Henry	4	4	59	
Cook, James	4	8 1/2	79	
Bennett, Thomas William	4	5	81	
Molineux, James	4	2 1/4	50	
Goodwin, Joseph	4	6 3/4	68	
Smith, William Henry	5	0 1/4	86	
Spratling, William	4	5 3/4	69	
Player, John Joseph	4	10 1/2	70	
Cook, William	4	3 1/2	66	
Kennedy, William	4	9 3/4	83	
Willis, Thomas John	4	11	87	
Williams, Thomas	4	6 3/4	71	
Hanna, John Charles	4	7 3/4	71	
Collison, Francis	4	2	56	
Totals	136	9 3/4	2,157	Made by Council of Military Education.
Averages	4	6 23/30	71 14 4/15	

E. Adams, Colonel,
Secretary and Adjutant.

Royal Military Asylum,
20 October 1863.

Appendix XIII.—No. 7.

App. XIII. No. 7.

Royal Naval School, Greenwich.

Weight and Height of Boys of the age of 14 years, determined on the 14th and 15th September 1863.

Names.	When 14.	Weight without Clothes.	Height without Shoes.
		lbs. oz.	Ft. in.
Robert Langmaid	Aug. 6	60 9	4 6
Alfred Wood	„ 9	71 9	4 7½
James W. Lifton	„ 16	84 1	5 2¾
John William Gardner	„ 23	109 5	5 2¼
Robert Clift	„ 29	69 9	4 10½
John Gough	„ 30	81 5	4 9½
Henry Morrison	„ 31	84 1	4 10½
Luke Jarvis	Sept. 5	69 5	4 9¼
James Beal	„ 5	70 1	4 9
Arthur Mainland	„ 7	77 9	4 8½
Robert Bruce	„ 8	69 5	4 7½
John Hill	„ 8	75 1	4 7½
Sampson Harris	„ 9	74 9	4 7½
Charles H. Williams	„ 10	73 9	4 7½
John J. Richards	„ 10	70 9	4 7½
George Arbuthnot	„ 14	84 1	4 10¼
Albert Robinson	„ 14	75 9	4 9¼
Joseph H. Potter	„ 18	57 5	4 5½
Edward W. Wild	„ 24	68 1	4 6
Lorenzo G. Carr	„ 25	64 1	4 4¾
William George Anabona	Oct. 4	84 1	4 11¾
Charles Newbury	„ 5	85 9	4 10¼
Richard A. Greenaway	„ 7	71 1	4 9½
John Thomas Fanton	„ 8	101 9	5 1½
Edwin G. Gill	„ 9	76 1	4 8½
William Scotton	„ 18	64 9	4 8¾
William J. Jago	„ 20	68 5	4 7¾
William H. Hinch	„ 24	65 1	4 6¼
George Thomas Buck	„ 25	77 5	4 9½
John W. Tauranac	„ 30	71 9	4 8½
Total		2,254 10	231 3¼
Means		75 2	4 8 9/16

Geo. Fisher.

App. XIV. No. 1.

Appendix XIV.—No. 1.

Statement of Lectures given to the Troops in the Winter of 1863–64.

Stations.	Lectures by Officers.	Lectures by Chaplains.	Lectures by School-masters.	Total of Lectures.	Estimated No. of Men at each Lecture.
Aldershot (c)	8	3	75	86	From 90[1] to 240[2]
Aberdeen	—	—	9	9	„ 97 „ 132
Athlone	1	—	33	34	„ 65 „ 229
Barbadoes (c)	—	—	7	7	No return.
Belfast	—	2	21	23	„ 60 „ 250
Bermuda	—	—	9	9	„ 50 „ 350
Birr	1	—	20	21	„ 20 „ 130
Ballincollig	1	8	—	9	„ 50 „ 120
Buttevant	—	—	13	13	„ 60 „ 250
Canterbury (c)	—	5	5	10	„ 50 „ 570
Chatham	—	—	12	12	„ 32 „ 245
Colchester	2	2	22	26	„ 80 „ 300
Cork	1	3	—	4	„ 80 „ 300
Curragh	—	—	107	107	„ 54 „ 338
Devonport (c)	—	—	7	7	„ 200 „ 350
Dover	—	5	12	17	No return.
Dublin	—	—	65	65	„ 40 „ 450
Edinburgh Castle	1	2	10	13	„ 85 „ 125
Fermoy	—	6	6	12	„ 100 „ 700
Gibraltar	—	—	—	67	„ 25 „ 682
Hounslow	—	—	11	11	„ 50 „ 210
Limerick	—	—	14	14	„ 100 „ 350
Manchester	—	—	7	7	„ 50 „ 90
Netley Hospital	3	—	5	8	„ 90 „ 300
Norwich	—	1	10	11	„ 6 „ 33
Parkhurst	—	—	8	8	„ 61 „ 230
Preston	—	—	10	10	„ 100 „ 400
Pembroke	2	—	9	11	„ 90 „ 400
Portsmouth Garrison:—					
Gun Wharf Barracks	—	—	7	7	„ 80 „ 200
Clarence Do.	—	—	18	18	„ 60 „ 120
Cambridge Do.	—	—	7	7	„ 150 „ 250
Fort Brockhurst, Gosport	—	—	9	9	„ 110 „ 170
New Barracks, Do.	—	—	5	5	„ 50 „ 100
Royal Hibernian School	—	—	7	7	250
Royal Military Asylum	—	1	32	33[3]	„ 240 „ 260
Sheerness	1	3	10	14	„ 60 „ 230
Shoeburyness	—	—	6	6	„ 35 „ 90
Sheffield	—	—	—	—	—
Shorncliffe	—	—	41	41	„ 170 „ 330
Stirling Castle	4	2	5	11	„ 50 „ 150
Templemore (c)	1	—	11	12	„ 100 „ 350

[1] The smallest number that attended a lecture.
[2] The greatest number that attended a lecture.
[3] These were given by the masters and students of the model schools. One lecture kindly given by Rev. R. Maynard, Army Chaplain.
(c) Concerts were given.

Stations.	Lectures by Officers.	Lectures by Chaplains.	Lectures by Schoolmasters.	Total of Lectures.	Estimated No. of Men at each Lecture.
Toronto (Canada West) -	—	—	10	10	From 30 to 50
Walmer - - -	—	—	9	9	„ 50 „ 280
Warley - - -	—	—	10	10	„ 83 „ 226
Wellington Barracks, London [1] - - -	—	—	45	45	„ 50 „ 650
Windsor - - -	—	—	9	9	130
Winchester - -	—	—	6	6	„ 140 „ 220
Woolwich [2] - -	—	6	23	29	„ 40 „ 450
York [3] - - -	2	3	10	15	„ 50 „ 150
Canada :					
Hochelaga - -	—	—	2	2	—
Hamilton - -	7	—	7	14	„ 20 „ 150
Kingston - -	4	—	24	28	„ 57 „ 220
London - - -	—	1	7	8	„ 38 „ 100
Montreal - -	—	—	3	3	Numerously.
Quebec - - -	—	—	23	23	„ 70 „ 300
Toronto - -	4	—	36 [4]	40	„ 30 „ 170
Total - -	43	58	889	1,052	

[1] Two concerts were given in addition to 45 lectures.

[2] Seven concerts and a theatrical entertainment were given in addition to the 29 lectures.

[3] Two of the lectures were given by Troop-Serjeant Major Thomas, and four by the quartermaster-serjeant.

[4] Of these, 9 were readings and recitations by Schoolmaster Hayward and assistants.

Appendix XIV.—No. 2.

Names of Army Schoolmasters who have given Lectures during the Season of 1863–64.

Station.	Schoolmasters.	Rank.	No. of Lectures.
Aldershott -	John Grant -	Superintending	45.
„ -	T. Ruffle -	2nd class -	7.
„ -	T. Wicks -	Army -	1.
„ -	C. Mallandain -	„ -	5.
„ -	D. J. Davies -	„ -	4.
„ -	T. H. Scarlett -	„ -	3.
„ -	J. Pither -	3rd class -	1 and 1 musical entertainment.
„ -	W. Arthur -	Army -	1 musical entertainment.
„ -	J. Porter -	3rd class -	1 musical entertainment.
„ -	J. Bass -	Army -	1 reading.

App. XIV. No. 2.

Station.	Schoolmasters.	Rank.	No. of Lectures.
Athlone	Richard McLean	2nd class	24.
„	W. Winter	4th „	4.
„	J. W. French	„	5.
Aberdeen	T. Anderson	Army	8.
„	R. Palmer	4th class	1.
Barbadoes	G. Holland	Army	5 and 2 concerts.
Belfast	W. M'Ewan	2nd class	13.
„	J. Perkins	Army	7.
Bermuda	Amos Parsons	2nd class	7.
Buttevant	George Rice	„	13.
Canada	J. Little	Superintending	3.
„	E. Bramhall	Army	12.
„	T. Polden	„	4.
„	A. Cameron	3rd class	3.
„	J. Foster	Army	7.
„	J. Hazard	„	15 and 9 readings, &c.
„	F. Alderton	2nd class	13.
„	W. Bryan	3rd „	3.
„	W. Colquhoun	Army	7.
Canterbury	J. Stewart	1st class	3.
„	H. Keley	2nd „	2.
Chatham	W. Gell	„	4.
„	A. Runcieman	„	5.
„	E. Whittaker	Army	1.
„	D. McIlheran	2nd class	2.
Colchester	W. Savage	1st class	13 and 1 reading, &c.
„	T. Jones	Army	1.
„	H. Mottram	„	2 and 1 reading.
„	J. Pither	3rd class	2 and 1 reading.
„	E. Annet	Army	2.
„	G. Ruggles	„	1.
Curragh	John Newsom	Superintending	59.
„	A. Runcieman	2nd class	9.
„	— Williams	Army	14.
„	T. O'Connor	„	13.
„	W. Minion	„	12.
Devonport	J. Hickling	2nd class	4.
„	W. Arthur	Army	1.
„	P. Stewart	„	1.
Dover	C. Stanton	1st class	2.
„	A. Barnes	Army	2.
„	C. Fleming	3rd class	8.
Dublin	J. Barnes	Superintending	61.
„	T. James	Army	4.
Edinburgh	E. Shipman	2nd class	8 and 2 readings.
Fermoy	J. Belling	1st „	3.
„	W. Morgan	3rd class	1.
„	T. Sheffield	Army	2.
Gibraltar	R. Brown	3rd class	16.
„	S. Goode	„	14.
„	F. Major	Army	13.
„	L. Matthews	„	6.
„	W. Morgan	3rd class	6.
„	G. Ogg	Army	6.
„	W. Stubbs	3rd class	16.
Hounslow	C. Atkinson	Army	11.
Limerick	E. Giles	1st class	4.
	H. Jesse	4th class	4.

Station.	Schoolmasters.	Rank.	No. of Lectures.
Limerick	P. Stewart	Army	1.
„	G. Ogg	„	1.
„	J. Sessford	„	2.
„	J. Boland	„	2.
Manchester	F. Lowry	„	7.
„	G. Boughton	„	7.
Netley Hospl.	E. Rogers	1st class	5.
Norwich	W. Shannon	Army	10.
Parkhurst	C. Clift	1st class	7.
„	T. Carson	Army	1.
Parsonstown (Birr).	G. Robertson	1st class	13.
„	H. Cochrane	4th „	7.
Pembroke	T. Earp	1st „	6.
„	D. Morrison	4th „	3.
Portsmouth	J. Grant	2nd „	14 and 6 readings.
„	W. Brown	Army	8.
„	W. Fryer	„	9.
„	G. Ruggles	„	2.
„	C. M. Wilson	3rd class	5.
„	T. Davison	„	7.
„	J. Murray	Army	5.
„	B. White	4th class	1.
Preston	C. Carnegie	1st „	9.
„	G. Venn	Army	1.
Shoeburyness	F. Toutt	Sch. serjeant	6.
Shorncliffe	H. Binckes	3rd class	27.
„	G. Annett	Army	14.
Stirling	J. Henderson	2nd class	4.
Sheerness	E. Lowman	„	10.
Templemore	R. Kirk	1st „	4.
„	J. McArdle	4th „	2.
„	J. Reilly	„	5.
Walmer	D. McKay	2nd „	7.
„	J. Coughlan	Army	2.
Warley	R. Green	2nd class	10.
Wellington Barracks.	S. Stockham	1st „	43 and 2 concerts.
Winchester	W. Le Mar	3rd „	6.
Winslow	W. Bird	1st „	9.
Woolwich	W. Thacker	-	3.
„	J. Bell	3rd „	2.
„	C. Webb	2nd „	11.
York*	-	-	4.

* The name is not given in the return.

App. XIV. No. 3.

Appendix XIV.—No. 3.

E. H. No. 836.

GENERAL ORDER.

Horse Guards, S.W.,
21*st September* 1863.

Schools.
(2—1863).

Arrangements having been made to provide a regular supply of diagrams and magic lantern slides, to illustrate the lectures which may be given, during the ensuing winter, to the troops at the several stations in the United Kingdom named in the annexed list marked A., the Field Marshal Commanding-in-Chief desires attention to the following rules, which have been drawn up for regulating this service,—and looks for the co-operation of commanding officers towards carrying out the same,—by ensuring the circulation of the slides and diagrams with that regularity upon which the success of the measure will mainly depend, and by the maintenance of order and decorum during the delivery of the lectures.

General officers commanding at the several foreign stations specified in the list B. will be pleased to give effect to these regulations within their respective commands, as far as local circumstances will permit, reporting from time to time their arrangements to this Department for the Field Marshal Commanding-in-Chief's information, and with a view to the same being communicated to the Council of Military Education.

1. The boxes and diagrams are now at the stations specified in the annexed list A., and should be placed in charge of the senior schoolmaster at the station, or some other schoolmaster detailed to that duty by the officer commanding.

2. *No box nor set of diagrams is to be kept at any station longer than three weeks*, at the end of which it is to be forwarded to the station next in order, as shown by list A.

3. As soon as a box has been forwarded, the Form No. 1,* properly filled up, is to be sent to the address given at the bottom of the form.

4. The Form No. 2* is to be filled up, and sent to the same address, on the receipt of a box of slides.

The *name* of the station, the *date* and the *full title* of the box, should be written on *each* Form.

5. When any of the slides are broken or injured, full particulars respecting the damage done are to be written on the margin of Form No. 2.

6. The slides must be carefully placed in each box, in the order given in the detailed lists, and the spaces between the slides and the sides of the box filled up with the wool which has been supplied for this purpose. The slides must be properly packed, to prevent breakage in the transit. The Chromatrope, in packing, should be placed at the *back* of the box.

---

* These forms and notices of lectures will be supplied by the Council of Military Education on application.

7. Each box is to be carefully locked, wrapped up in strong paper, and addressed to

The Officer Commanding,
Camp, Depôt, &c.
*
†

Magic Lantern Slides,
Per Rail, &c.

8. The diagrams must be rolled carefully *on the piece of wood that is forwarded with each set,* packed in strong brown paper, and addressed as stated in No. 7. The word *Diagrams* is to be written instead of *Magic Lantern Slides.*

9. As some of the keys of the circulating boxes have been lost, a pass-key will in future be sent to each of the camps, garrisons, &c., to which the boxes of slides are transmitted. This pass-key is to be given over to the schoolmaster having charge of the magic lanterns, and he will, on removal to another station, deliver it over, with the magic lanterns, boxes, and diagrams he may have in his possession, to such schoolmaster as may be detailed under the orders of the General, or other officer in command, for that duty.

10. The circulation of the boxes and diagrams is to commence on the 15th of October 1863, and to cease in March 1864.

11. The boxes and diagrams should circulate *not later* than the periods stated below :—

I. October 15th, 1863.	V. January 16th, 1864.‡
II. November 7th, „	VI. February 6th, „
III. „ 28th, „	VII. March 1st, „
IV. December 19th, „	VIII. „ 25th, „

The boxes and diagrams are to *remain* at the stations to which they may be sent in March, in charge of the schoolmaster, until again required for circulation.

12. That the lecturer may have the means of obtaining the information necessary for the various lectures, suitable text books § will be supplied to such of the libraries, at the stations among which slides will henceforward circulate, as do not already possess them. As the boxes are transmitted to the stations in succession, each schoolmaster will find on referring to list A. the subject on which he will have to lecture when the next set of diagrams or box of slides shall reach the station to which he is attached.

13. Application should be made as early as possible, in conformity with the War Office Circular No. 601, for such of the following articles as may be required, viz. :—

Best Sperm Oil.	Chlorate of Potash.
Wicks.	Lime Ball Cylinders.
Tin Oil Filler.	Metal Rods for Sheet.
Chimney Glasses.	Pair of Scissors.
Chamois Leather.	Brown Paper for Packing.
Camphor.	Twine for Packing.
Spirits of Wine.	Sheet or Screen, when required.
Black Oxide of Manganese.	

* Town or city.
† County or country.
‡ *A month is allowed at Christmas.*
§ *See* detailed lists of Slides and Diagrams.

App. XIV. No. 3.

And also for authority for the following payments :—

(1.) Carriage of the boxes of circulating magic lantern slides.
(2.) Postage of letters on subject of their circulation.
(3.) Washing of the cloth screen or sheet.

14. All communications respecting the magic lanterns, lectures, &c. are to be addressed to

The Secretary,
Council of Military Education,
13, Great George Street,
London, S.W.

Marked in corner (Magic Lanterns.)

15. Lecturers should bear in mind that:

(1.) As a general rule, it is not advisable that the lectures should exceed an hour in delivery.

(2.) The lectures should be made as interesting as possible; statistical and dry details ought to be omitted, unless the lecturer considers it absolutely necessary that such should be mentioned, for the sake of illustration or comparison.

(3.) All explanations should be in clear and simple language; but where technical and scientific terms are necessary, they should be explained and rendered as intelligible as possible, having reference to the class the lecturer is addressing.

(4.) *No slide should be allowed to remain in the lantern longer than* 10 *minutes.*

16. An account of the lectures delivered during the season is to be transmitted in April, on the Form provided for this purpose.

By Command of His Royal Highness
The Field Marshal Commanding-in-Chief,
JAMES YORKE SCARLETT,
Adjutant-General.

A.—The Boxes of Slides and Diagrams are to be transferred from Station to Station in the following order.

Number.	Subjects.	Present Station.	To be transferred at Dates specified below.							
			1863. 15 October.	1863. 7 November.	1863. 28 November.	1863. 19 December.	1864. 16 January.	1864. 6 February.	1864. 1 March.	1864. 25 March.
1	Castles and Abbeys. Diagram on Australia.	Aldershot	Shorncliffe	Dover	Walmer	Canterbury	Sheerness	Chatham	Woolwich	Shoeburyness
2	Battle Fields and Remarkable Places.	Shorncliffe	Dover	Walmer	Canterbury	Sheerness	Chatham	Woolwich	Shoeburyness	Warley
3	South African Animals	Dover	Walmer	Canterbury	Sheerness	Chatham	Woolwich	Shoeburyness	Warley	Colchester.
4	English History. Box A.	Walmer	Canterbury	Sheerness	Chatham	Woolwich	Shoeburyness	Warley	Colchester	Norwich.
5	Astronomy. Box 2	Canterbury	Sheerness	Chatham	Woolwich	Shoeburyness	Warley	Colchester	Norwich	Wellington Barracks.
6	Natural Phenomena. Box 2.	Sheerness	Chatham	Woolwich	Shoeburyness	Warley	Colchester	Norwich	Wellington Barracks.	Hounslow.
7	The Earth. Box 1	Chatham	Woolwich	Shoeburyness	Warley	Colchester	Norwich	Wellington Barracks.	Hounslow	Windsor.
8	Eastern Views	Woolwich	Shoeburyness	Warley	Colchester	Norwich	Wellington Barracks.	Hounslow	Windsor	Royal Mil. Asylum.
9	Bible Mountains, &c.	Shoeburyness	Warley	Colchester	Norwich	Wellington Barracks.	Hounslow	Windsor	Royal Mil. Asylum.	Winchester.
10	Wild Sports in the East	Warley	Colchester	Norwich	Wellington Barracks.	Hounslow	Windsor	Royal Mil. Asylum.	Winchester	Portsmouth.
11	Arctic Regions. Diagram on Locomotion.	Colchester	Norwich	Wellington Barracks.	Hounslow	Windsor	Royal Mil. Asylum.	Winchester	Portsmouth	Parkhurst.
12	Campaigns of Wellington	Norwich	Wellington Barracks.	Hounslow	Windsor	Royal Mil. Asylum.	Winchester	Portsmouth	Parkhurst	Devonport.
13	General Views of Cities	Wellington Barracks.	Hounslow	Windsor	Royal Mil. Asylum.	Winchester	Portsmouth	Parkhurst	Devonport	Pembroke.
14	Natural History. Box 2	Hounslow	Windsor	Royal Mil. Asylum.	Winchester	Portsmouth	Parkhurst	Devonport	Pembroke	Cork.
15	Roman History. Box 1	Windsor	Royal Mil. Asylum.	Winchester	Portsmouth	Parkhurst	Devonport	Pembroke	Cork	Ballincollig.
16	Views in London	Royal Mil. Asylum.	Winchester	Portsmouth	Parkhurst	Devonport	Pembroke	Cork	Ballincollig	Fermoy.
17	The Earth. Box 2. Diagram on Hindostan.	Winchester	Portsmouth	Parkhurst	Devonport	Pembroke	Cork	Ballincollig	Fermoy	Buttevant.
18	Astronomy. Box 1. Africa and the Africans.	Portsmouth	Parkhurst	Devonport	Pembroke	Cork	Ballincollig	Fermoy	Buttevant	Limerick.
19	English History. Box 3	Parkhurst	Devonport	Pembroke	Cork	Ballincollig	Fermoy	Buttevant	Limerick	Templemore.
20	Natural Phenomena. Box 3. Diagrams on China.	Devonport	Pembroke	Cork	Ballincollig	Fermoy	Buttevant	Limerick	Templemore	Parsonstown

Magic Lanterns—*continued.*

Number.	Subjects.	Present Station.	To be transferred at Dates specified below.							
			1863. 15 October.	1863. 7 November.	1863. 28 November.	1863. 19 December.	1864. 16 January.	1864. 6 February.	1864. 1 March.	1864. 25 March.
21	Wild Sports of the World	Pembroke -	Cork - -	Ballincollig	Fermoy -	Buttevant -	Limerick -	Templemore	Parsonstown	The Curragh.
22	Diagrams on Eastern Habitations.	Cork - -	Ballincollig	Fermoy -	Buttevant -	Limerick -	Templemore	Parsonstown	The Curragh	Athlone.
23	Views in India - -	Ballincollig	Fermoy -	Buttevant -	Limerick -	Templemore	Parsonstown	The Curragh	Athlone -	Dublin.
24	Bible Cities - -	Fermoy -	Buttevant -	Limerick -	Templemore	Parsonstown	The Curragh	Athlone -	Dublin -	Roy. Hibrn. School.
25	Overland Route - -	Buttevant -	Limerick -	Templemore	Parsonstown	The Curragh	Athlone -	Dublin -	Roy. Hibrn. School.	Belfast.
26	Wild Sports of North America.	Limerick -	Templemore	Parsonstown	The Curragh	Athlone -	Dublin -	Roy. Hibrn. School.	Belfast -	Stirling.
27	English History. Box 2 -	Templemore	Parsonstown	The Curragh	Athlone -	Dublin -	Roy. Hibrn. School.	Belfast -	Stirling -	Aberdeen.
28	Arms, Dress, and Engines of War.	Parsonstown	The Curragh	Athlone -	Dublin -	Roy. Hibrn. School.	Belfast -	Stirling -	Aberdeen -	Edinburgh.
29	New Zealand. Diagram on Ancient Egypt.	The Curragh	Athlone -	Dublin -	Roy. Hibrn. School.	Belfast -	Stirling -	Aberdeen -	Edinburgh -	York.
30	Events in Indian History	Athlone -	Dublin -	Roy. Hibrn. School.	Belfast -	Stirling -	Aberdeen -	Edinburgh -	York - -	Preston.
31	The Two City Apprentices. The Crusades.	Dublin -	Roy. Hibrn. School.	Belfast -	Stirling -	Aberdeen -	Edinburgh -	York - -	Preston -	Manchester.
32	Historical Places - -	Roy. Hibrn. School.	Belfast -	Stirling -	Aberdeen -	Edinburgh -	York - -	Preston -	Manchester	Sheffield.
33	Natural Phenomena. Box 1.	Belfast -	Stirling -	Aberdeen -	Edinburgh	York - -	Preston -	Manchester	Sheffield -	Royal Mil. Asylum.
34	Ancient Cities - -	Stirling -	Aberdeen -	Edinburgh -	York - -	Preston -	Manchester	Sheffield -	Royal Mil. Asylum.	Aldershot.
35	English History. Box 1 -	Aberdeen -	Edinburgh -	York - -	Preston -	Manchester	Sheffield -	Royal Mil. Asylum.	Aldershot -	Shorncliffe.
36	Æsop's Fables - -	Edinburgh -	York - -	Preston -	Manchester	Sheffield -	Royal Mil. Asylum.	Aldershot -	Shorncliffe -	Dover.
37	Plants and Trees. Diag. on Livingstone's Discoveries.	York - -	Preston -	Manchester	Sheffield -	Royal Mil. Asylum.	Aldershot -	Shorncliffe -	Dover - -	Walmer.
38	China and Chinese -	Preston -	Manchester	Sheffield -	Royal Mil. Asylum.	Aldershot -	Shorncliffe -	Dover - -	Walmer -	Canterbury.
39	Natural History. Box 1 -	Manchester	Sheffield -	Royal Mil. Asylum.	Aldershot -	Shorncliffe -	Dover - -	Walmer -	Canterbury	Sheerness.
40	Ancient and Modern Egypt.	Sheffield -	Royal Mil. Asylum.	Aldershot -	Shorncliffe -	Dover - -	Walmer -	Canterbury	Sheerness -	Chatham.
41	The Holy Land. Diagram on Bible History.	Royal Mil. Asylum.	Aldershot -	Shorncliffe -	Dover - -	Walmer -	Canterbury	Sheerness -	Chatham -	Woolwich.

B. LIST OF FOREIGN STATIONS. APP. XIV. No. 3.

1. Montreal
2. Quebec*
3. Halifax
4. Fredericton
5. Bermuda
6. Jamaica
7. Barbadoes
8. The Cape
9. Mauritius
10. Ceylon
11. Australia
12. Gibraltar
13. Malta*
14. Corfu*
15. Hong Kong
16. New Zealand*
17. St. Helena*

Diagrams and slides for lectures have been forwarded to these stations.

An account of the lectures delivered during the season is to be forwarded from each of these stations.

No sets of diagrams have been sent to those stations against which an asterisk is placed.

1. The slides and diagrams forwarded to Ceylon are to circulate from Colombo to the following stations:—Newera, Ellia, Kandy, Trincomalee, Galle.
2. The slides and diagrams sent to Montreal, in 1860 and 1862, and those that will be sent this year, are to circulate, in order, to Quebec, Kingston, Toronto, Hamilton, and London.
   No set of slides should remain at any station longer than four weeks.
3. The slides at present at Gibraltar, Malta, and Corfu are to be exchanged as often as convenient.

SLIDES SENT TO GIBRALTAR.

South African Animals.	Wild Sports, North America.
Astronomy.	English History. Box A.
Historical Places.	Tale of a Tub.
Livingstone's Travels.	Jack and Bean Stalk.

Diagrams on

Physiology.	Microscope.
Locomotion.	Telescope.

SLIDES SENT TO MALTA.

Natural History.
Wild Sports in the East.
Overland Route.
China and Chinese.
Astronomy.
New Zealand.
Wild Sports of the World.
Views in India.

SLIDES SENT TO CORFU.

Natural Phenomena.
Geographical Views.

APPARATUS.

Apparatus for lectures on Chemistry, Electricity, or Magnetism have been supplied to the following stations and corps on application.

1. Aldershot.
2. Shorncliffe.
3. Colchester.
4. Parkhurst.
5. Grenadier Guards.
6. 2nd Life Guards.
7. Coldstream Gds. 1st Bat.
8. The Curragh.
9. Athlone.
10. Buttevant.
11. Templemore.
12. Parsonstown.
13. Limerick.
14. The Cape.
15. New Zealand.
16. Gibraltar.
17. St. Helena.

App. XIV
No. 4.

Appendix XIV.—No. 4.

MAGIC LANTERNS.

Detailed Lists of the Slides and Diagrams issued under the direction of the Council of Military Education for the Illustrations of Lectures to the Troops at home and abroad.

CONTENTS.

	Page
Æsop's Fables	195
Africa: Livingstone's Discoveries in (D) *	207
Africa and the Africans	195
African Animals, South	195
American Indians, North	195
Ancient Cities	196
Arctic Regions	196
Arms, Dress, and Engines of War	196
Astronomy, Box 1	197
" Box 2	197
Australia and Australian Life (D)	208
Battle Fields, and Remarkable Places	197
Bible Cities	197
Bible Mountains	198
Books, List of Text	210
Castles and Abbeys, Box 1	198
" " Box 2	198
China and the Chinese	198
" " " (D)	208
Cities, Towns, &c., General Views of	198
City Apprentices, The Two	199
Conquest of Mexico	199
Crusades	199
Directions for using the Lantern	214
Domestic Arrangements of Orientals (D)	208
Earth, The; its Rocks and Fossils, Box 1	200
Earth, The; its Rocks and Fossils, Box 2	200
Eastern Views, Manners, &c.	200
Eastern Habitations (D)	208
Early English History (D)	208
Egypt, Ancient (D)	209
" " and Modern	200
English History, Box 1	201
" " Box 2	201
" " Box 3	201
" " Box 4	202
" " Box A	202
Form, No. 1	213
" No. 2	213
" No. 3	213
Form of Notice for Lectures	213
Hindostan and Hindoos (D)	209
History, Natural, Box 1	202
" " Box 2	203
" Roman	203
" Indian	203
" England	201
Historical Places	203
Holy Land	203
Indian History, Events in	203
Japan and her People	204
Lantern, directions for using the	214
Locomotion, Progress made in (D)	210
London, Views in	204
" Old	204
New Zealand	204
Nursery Tales	204
Overland Route	205
Phenomena, Natural, Box 1	205
" " Box 2	205
" " Box 3	206
Plants and Trees	206
Russia and the Russians	206
Text-Books for Lectures, List of	210
Views in India	206
Wellington, Campaigns of	207
Whittington, Dick, History of	199
Wild Sports in the East	207
Wild Sports of the World	207

* The letter D. in each case denotes diagrams.

MAGIC LANTERNS.

App. XIV. No. 4.

Lists of Slides for Lectures.

Æsop's Fables.

1. The Fox and the Stork.
2. The Wolf and the Lamb.
3. The Eagle and the Tortoise.
4. The Fox without a Tail.
5. The Frog and the Ox.
6. The House Dog and the Wolf.
7. Mercury and the Woodman.
8. The Ass and the Lap-Dog.
9. The Miller, his Son, and their Ass.
10.
11.
12.
13.
14.
15. Wreath and Good Night.
16. Comic: Cats on Tiles.
17. „ Cat following a Rat.
18. „ Cauliflower and Topsy.

Africa and the Africans.

1. Map of Africa.
2. Mandingo.
3. Zoola Village.
4. Mumbo Jumbo.
5. Moorish Horsemen.
6. Male Elephant.
7. Scene on the Niger.
8. Tawarek Camp.
9. Female Soldier of Dahomey.
10. Ashantee Chief.
11. Agades in the Desert.
12. Mesurata Chief.
13. Return of the Sultan of Massena.
14. Katema on the shoulders of Prime Minister.
15. Lake Tchad.
16. Gorilla.
17. Timbuktu.
18. Chromatrope.*
19. Comic.
20. „
21. „

South African Animals.

1. Map of Africa.
2. Rhinoceros coming to a stream.
3. Elephants bathing.
4. Hippopotamus; brink of a river.
5. Gnu recoiling from the brink of a precipice.
6. Brindled Gnu; nests of social Weaver Birds.
7. Buffalo; Crocodile; river scene.
8. Quagga; Antelopes; South African plains.
9. Spotted Antelope; South African vegetation.
10. African Hog in a jungle.
11. Wild Boar; South African vegetation.
12. Lion attacking a Kaffir.
13. Kaffir Village (Bechuana); Cattle, &c.
14. Chromatrope.
15. Comic: Harlequin Dancing.
16. „ Zouaves killing Cats.
17. Old Man and Cat.

North American Indians.

Sports, Manners, Customs, &c.

1. Map of North America.
2. Bison Hunting in wolf-skins.
3. Hunting the Grizzly Bear.
4. Catching a Wild Horse with the lasso.
5. Bear Hunt among the Chippeways.
6. Hunting the Bison in Winter.
7. Spearing Seals from a canoe.
8. Walrus Hunt.
9. Whale Fishing.
10. Buffalo Dance by Indians.
11. Bear Dance by Indians.
12. Comanche Indians Fighting.
13. Chromatrope.
14. Comic: Clown.
15. „ Cobbler.
16. „ Indian Dancing.

* The Chromatrope in each case is to be placed at the *back of the box*, and the slides are to be arranged in the order given in the lists.

App. XIV. No. 4.

Ancient Cities.

1. Petra, the Chasm or Entrance, with view of the Khusne.
2. Petra; view of the Temple called the Khusne.
3. Petra; the Theatre.
4. Ruins of Tyre.
5. Thebes, in Egypt.
6. Damascus.
7. Baalbec.
8. Palmyra.
9. Ephesus.
10. Ruins at Ephesus.
11. Sardis; remains of an ancient Temple.
12. Babylon.
13. Chromatrope.
14. Comic: Dancing Clown.
15. „ Village Blacksmith.
16. „ Nailing Colours to the Mast.

The Arctic Regions.

1. Map to illustrate Parry's Discoveries.
2. Floating Icebergs.
3. "Hecla" and "Griper" in Winter Quarters.
4. Deliverance of Sir John Ross and Party.
5. Portrait of Sir John Franklin.
6. The "Erebus" and "Terror"; Beechy Island.
7. Captain Austin's sledging expedition.
8. Captain Maclure as an Arctic Traveller.
9. Map of Boothia and King William's Land, to illustrate Captain M'Clintock's search for Sir John Franklin.
10. Departure of exploring parties from Port Kennedy.
11. M'Clintock's first interview with the Esquimaux at Cape Victoria.
12. Breaking open the Cairn.
13. The Document.
14. Chromatrope.
15. Comic: Mr. Bull.
16. „ Punch and Judy.
17. „ A Windy Day.

Arms, Dress, and Engines of War.

1. Greek Hoplite in full armour.
2. March of a Greek Army.
3. Charge of the Roman Legion.
4. Battering Ram.
5. Testudo.
6. Onset of Numidian Horse.
7. British War Chariot, Shield, and Spears.
8. Anglo-Saxon King, Armour Bearer, and Soldiers.
9. Early Danish Invaders.
10. Norman Knight and Archer.
11. Templars of the time of Richard I.
12. Edward I. in full armour.
13. Archers, Long Bow, and Cross Bow.
14. Attack of a Fortified Town, with Mangonel, Battering Ram, and Wooden Gallery, showing the mode of carrying on military operations before the introduction of gunpowder.
15. Chromatrope.
16. Comic: Turkish Drummer.
17. „ Recruit at Drill.
18. „ Chelsea Pensioners.
19. „ English and Russian Guards.

Astronomical Set.—Box 1.

1. The Solar System, showing the revolution of all the Planets with the Satellites round the Sun.
2. The Earth's annual motion round the Sun, showing the parallelism of its axis, producing the Seasons.
3. The cause of Spring and Neap Tides, and the Moon's phases during her revolution.
4. The direct and retrograde motion of Venus and Mercury.
5. Illustrations of the Earth's rotundity.
6. The Revolution of a Comet round the Sun.
7. The diurnal motion of the Earth, showing the rising and setting of the Sun, illustrating the cause of Day and Night.
8. The annual motion of the Earth round the Sun, with the lunations of the Moon.
9. The various Eclipses of the Sun, with the transit of Venus.
10. Chromatrope.
11. Comic.
12. „ Cat and Mouse.
13. „ The Village Blacksmith.
14. „ Sailor's Hornpipe.
15. „ Black Draught.
16. „ Boy and Gunpowder.

Astronomical Set.—Box 2.

1. System of Ptolemy.
2. „ of Copernicus.
3. „ of Tycho Brahé.
4. „ of Newton.
5. Signs of the Zodiac.
6. Telescopic view of the Moon.
7. „ view of Jupiter.
8. „ view of Saturn.
9. „ view of Saturn.
10. Orbit of a Comet.
11. Comet of 1811 and 1860.
12. Constellation of Ursa Major.
13. „ of Orion.
14. Various Nebulæ.
15. Portion of the Milky Way.
16. Chromatrope.
17. Comic Slide: Green's Balloon.
18. Comic: Emperor of Russia.
19. „ Snip, Tailor.
20. „ Jugged Hare.

Battle Fields and Remarkable Places.

1. Winchester Cathedral.
2. Stirling Castle.
3. Battle of Crecy.
4. Battle of Neville's Cross.
5. Warkworth Castle.
6. Alnwick Castle.
7. Berwick-on-Tweed.
8. Norham Castle.
9. Battle of Culloden.
10. Battle of Flodden Field.
11. Camp at Tilbury.
12. Hampton Court.
13. Chromatrope.
14. Comic: Clown and Pie.
15. „ Man Fishing.
16. „ Soldiers Fighting.
17. „ Good Night.

Bible Cities.

1. Rameses in Egypt.
2. Ezion Geber.
3. Map of Palestine.
4. Ruins of Tyre.
5. Acre, or Accho.
6. Cesarea of Palestine.
7. Jaffa, or Joppa.
8. Gaza.
9. Samaria.
10. Beisan, or Bethshan.
11. Nablous, or Shechem.
12. Ramah.
13. Hebron.
14. Bethany.
15. Jerusalem.
16. Chromatrope.
17. Comic.
18. „
19. „

App. XIV. No. 4.

Bible Mountains, Rivers, &c.

1. Mount Ararat.
2. Mounts Horeb and Sinai.
3. Convent of St. Katherine, and Mount Sinai.
4. Map of Palestine.
5. Mountains of Lebanon.
6. Mount Hermon.
7. Mount Tabor.
8. Mount Carmel.
9. Ebal and Gerizim.
10. Plain of Jezreel.
11. Plain of Jericho.
12. Fords of the Jordan.
13. River Jabbok.
14. Sea of Galilee, or Tiberias.
15. The Dead Sea.
16. Valley of Jehoshaphat.
17. Mount Hor.
18. Chromatrope.
19. Comic.
20. „

Castles and Abbeys.—Box 1.

1. Melrose Abbey.
2. Edinburgh Castle.
3. Lochleven Castle.
4. Alnwick Castle.
5. Warwick Castle.
6. Carnarvon Castle.
7. Conway Castle.
8. Pembroke Castle.
9. Tintern Abbey.
10. Carisbrook Castle.
11. Dover Castle.
12. Windsor Castle.
13. Chromatrope.
14. Comic: Old Man and Harlequin.
15. „ Rowing Match.
16. „ Punch.

Castles and Abbeys.—Box 2.

1. Scone.
2. Church of Iona.
3. Bothwell Castle.
4. Holy Cross Abbey.
5. York Castle.
6. Tewkesbury Abbey.
7. Shrewsbury Castle.
8. Chepstow Castle.
9. Raglan Castle.
10. Cardiff Castle.
11. Lewes Castle.
12. Arundel Castle.
13. Waltham Abbey.
14. Walmer Castle.
15. Comic.
16. „
17. „
18. Chromatrope.

China and the Chinese.

1. Map of China.
2. Hong Kong.
3. Street in Canton.
4. Pekin.
5. The Great Wall of China.
6. The Emperor.
7. Interior of a Temple, with idols and worshippers.
8. Group of Soldiers.
9. Travelling Tinker.
10. Playing at Shuttlecock.
11. Cat Merchant.
12. Feast of Lanterns.
13. Chromatrope.
14. Comic: Chinaman Dancing.
15. „ Blacksmith.
16. „ Jumping Monkey.

General Views of Cities, Towns, &c.

1. London from Greenwich Park.
2. Lisbon.
3. Rome.
4. Bay of Naples.
5. Venice.
6. Athens.
7. Cronstadt.
8. Constantinople.
9. Sebastopol, evacuation of.
10. Sierra Leone.
11. Acre.
12. Quebec.
13. Chromatrope.
14. Comic: Sailor and Pig.
15. „ Clown and Calf's Head.
16. „ Turk's Head.

The Two City Apprentices.

1. Thomas Idle and Francis Goodchild at their looms.
2. Francis Goodchild at church.
3. Thomas Idle and his companions at play in the churchyard during Divine Service.
4. Francis Goodchild is a favourite with his master the Merchant.
5. Thomas Idle having forfeited his indentures is turned away and sent to Sea.
6. Francis Goodchild is out of his time, and married to his master's daughter.
7. Thomas Idle, having returned from Sea, is guilty of robbery and murder.
8. Thomas Idle is impeached by an accomplice before Alderman Goodchild.

The History of Dick Whittington.

1. Whittington and the Waggoner.
2. Whittington enters the Service of Mr. Fitzwarren.
3. Whittington purchases a Cat.
4. Whittington listening to the sound of Bow Bells.
5. Whittington parts with his Cat.
6. Whittington's Cat sold.
7. Whittington's Treasures.
8. Whittington Knighted.
9. Chromatrope.
10. Comic: Village Dentist.
11. „ Boy jumping over a post.
22. „ Not caught yet.

Conquest of Mexico.

1. Cortez taking leave of Velasquez.
2. Map of Cuba, showing the route of Cortez.
3. Cortez addressing his forces at Cape Antonio, Cuba.
4. First cavalry charge headed by Cortez.
5. Map showing the route of Cortez from Cozumel.
6. Destroying the idols at Zempoalla.
7. Massacre in Cholula.
8. First view of the Mexican capital.
9. Meeting of Cortez and Montezuma.
10. Plan of the city of Mexico.
11. Cortez removing Montezuma's fetters.
12. Fall of Montezuma.
13. The Battle upon the Causeway.
14. The capture of Guatemozin.
15. Comic.
16. „
17. „
18. Chromatrope.

The Crusades.

1. Preaching of Peter the Hermit.
2. Constantinople.
3. Map of Turkey in Asia.
4. Desth of Count Robert of Paris.
5. Antioch.
6. Siege of Jerusalem.
7. City of Jerusalem. Modern view.
8. Aleppo.
9. Conflict on the Heights near Laodicea.
10. Master of the Hospital.
11. Master of the Temple.
12. Cyprus.
13. Cœur de Lion on the battle-field of Assur.
14. Ascalon.
15. Tunis.
16. Landing of the Conqueror of Evesham at Acre.
17. Comic.
18. „
19. „
20. Chromatrope.

App. XIV. No. 4.

The Earth: its Rocks and Fossils.—Box 1.

1. Section showing the arrangement of the Strata.
2. Relations of stratified and unstratified Rocks.
3. Fingal's Cave.
4. Vesuvius.
5. Jorulla in Mexico.
6. Submarine Volcano: Graham's Island in the Mediterranean.
7. Trilobite and eye of ditto.
8. Cephalaspis (buckler-headed fish).
9. Pterichthys (horned wing-fish).
10. Coccosteus (berry-boned).
11. Coal Plants.
12. Flora of the coal period.
13. Encrinite (stone lily).
14. Fishes of the Permian System.
15. Foot-prints and Rain Drops.
16. Labyrinthodon.
17. Chromatrope.
18. Comic Slide: All Hot.
19. „ Chelsea Pensioners.

The Earth: its Rocks and Fossils.—Box 2.

1. Section showing the arrangement of the Strata.
2. Ammonite.
3. Ammonites (various).
4. Plesiosaurus (near or resembling a reptile).
5. Ichthyosaurus (fish-reptile).
6. Pterodactyle (the wing-toed or flying Lizard).
7. Belemnite (vulgarly called *Thunderbolt*).
8. Iguanodon.
9. Hylæosaurus (reptile of the woods).
10. Teeth from the chalk.
11. Palæotherium (ancient beast skeleton).
12. Palæotherium (restored).
13. Magatherium (great wild beast).
14. Mammoth.
15. Irish Elk.
16. Comic: Best London Porter.
17. „ Village Blacksmith.
18. „ Rowers.
19. „ Punch and Judy.
20. Chromatrope.

Eastern Views, Manners, Customs, &c.

1. Smyrna.
2. Tarsus.
3. Beyrout.
4. Syrian Turk's Divan.
5. Maronite Sheikh and Wife.
6. Tripoli.
7. Druse Marriage Procession.
8. Damascus.
9. Mosque in Damascus.
10. Antioch.
11. Mecca Pilgrims.
12. Aleppo.
13. Seyde.
14. Bagdad.
15. Chromatrope.
16. Comic.
17. „
18. „

Ancient and Modern Egypt.

1. Map of Egypt.
2. Overflow of the Nile.
3. Nile Boat.
4. Pyramids and Sphinx.
5. Entrance to the Great Temple at Luxor.
6. Statues of Memnon at Thebes.
7. Portion of Great Hall of Columns, Karnak.
8. Façade of Rock Temple at Aboo Simbel.
9. Crocodile on sandbank in the Nile.
10. Mummy in case.
11. Alexandria.
12. Cairo, by night.
13. Tombs of the Mameluke Kings as Cairo.
14. Portrait of Mehemet Ali.
15. Chromatrope.
16. Comic: Dog and Monkey.
17. „ Clown and Donkey.
18. „ Punch.

ENGLISH HISTORY.—Box 1

From B.C. 55 to A.D. 1154.

1. Ancient Britons.
2. Landing of Julius Cæsar.
3. Stonehenge.
4. Queen Boadicea.
5. The Landing of the Saxons.
6. Alfred the Great in the peasant's hut.
7. Saxon King and armour bearer.
8. Edgar the Pacific rowed on the Dee by eight tributary Princes.
9. Danish Soldiers.
10. Meeting of Ironside and Canute.
11. Canute reproving his Courtiers.
12. Battle of Hastings.
13. The First Crusade.
14. The Death of William Rufus.
15. King Stephen.
16. Chromatrope.
17. Comic: The Falconer.
18. „ My Pretty Doll.
19. „ The Dishonest Customer.
20. „ The British Tar.

ENGLISH HISTORY.—Box 2.

From A.D. 1154 to A.D. 1399.

1. Geoffrey Plantagenet.
2. Richard Cœur de Lion.
3. Richard at the Battle of Jaffa, A.D. 1192.
4. Death of Prince Arthur, A.D. 1202.
5. Signing Magna Charta, A.D. 1215.
6. Henry III. and Simon de Montfort, A.D. 1258.
7. Henry III. at the Battle of Lewes, A.D. 1264.
8. Edward I. presenting his infant son to the Welsh, A.D. 1284.
9. Baliol does homage for the crown of Scotland, A.D. 1292.
10. Wallace crowned with laurel in Westminster Hall, A.D. 1305.
11. Death of Comyn, A.D. 1306.
12. Battle of Bannockburn, A.D. 1314.
13. Plan of the Battle of Bannockburn.
14. Battle of Poictiers, A.D. 1356.
15. Death of Wat Tyler, A.D. 1381.
16. Court Mummers.
17. Drunkard's Cloak.
18. Man and Woman in the Stocks.
19. Watchmen of the olden time.
20. Chromatrope.

ENGLISH HISTORY.—Box 3.

From A.D. 1401 to A.D. 1485.

1. The Rebels at Shrewsbury; Hotspur, Douglas, and the Earl of Worcester, A.D. 1403.
2. Henry V. and the French Herald at Agincourt, A.D. 1415.
3. Henry VI. in armour, A.D. 1422.
4. Joan of Arc leading her troops to Orleans, A.D. 1429.
5. Plucking the Roses.
6. Fields near St. Albans, A.D. 1455.
7. Clifford stabbing Rutland, A.D. 1460.
8. Queen Margaret in the outlaw's cave, A.D. 1464.

App. XIV. No. 4.

9. Field of Battle near Barnet, A.D. 1471.
10. The Victor and the Vanquished; Edward IV. and Prince Edward of Lancaster, A.D. 1471.
11. Death of the Duke of Clarence, A.D. 1478.
12. Bosworth Field; Lord Stanley bringing the crown of Richard to Richmond, A.D. 1485.
13. Tournament.
14. Chromatrope.
15. Comic.
16. „

English History.—Box 4.

Henry VII. and Henry VIII. From A.D. 1485 to A.D. 1547.

1. Henry VII., 1485.
2. The pretended Earl of Warwick, 1486.
3. Henry VII.'s Chapel, 1503.
4. Foot Soldier of the time of Henry VII.
5. Henry VIII., 1509.
6. The Battle of Spurs, 1513.
7. Flodden Field, 1513.
8. Great Ship of Henry VIII.
9. Field of the Cloth of Gold, 1520.
10. Execution of Buckingham, 1521.
11. Maying at Shooter's Hill.
12. Hampton Court Palace, 1525.
13. Francis I., King of France, taken prisoner at the battle of Pavia, 1525.
14. Henry VIII. in armour.
15. City Watchmen in the time of Henry VIII.
16. Comic.
17. „
18. „
19. Chromatrope.

English History.—Box A.

From A.D. 1688 to A.D. 1727.

1. Glencoe, 1691.
2. William III. thrown from his horse near Hampton Court, 1702.
3. The Duke of Marlborough.
4. The Battle of Blenheim, or Hochstet, gained by the Duke of Marlborough and Prince Eugene over the French and Bavarians, 1704.
5. Gibraltar captured by Sir George Rooke, 1704.
6. Narrow escape of Marlborough at the Battle of Ramilies, 1706.
7. The Battle of Malplaquet, 1709.
8. Tournay, 1709.
9. Utrecht, 1713.
10. The Chevalier St. George, 1715.
11. Glengarry's Charge at the Battle of Sheriffmuir, 1715.
12. The Countess of Derwentwater pleading for her husband's life, 1716.
13. Change Alley, during the phrenzy of the South Sea Bubble, 1720.
14. Chromatrope.
15. Comic.
16. „
17. „
18. „

Natural History.—Box 1.

1. Welcome.
2. Lion.
3. Tiger.
4. Bison.
5. Otter.
6. Giraffe.
7. Hippopotamus.
8. Porcupine.
9. Narwhal.
10. Wolf.
11. King Vulture.
12. Albatross.
13. Rattlesnake.
14. Comic: Clown Dancing.
15. „ Cow with Iron Tail.
16. Good Night.

Natural History.—Box 2.

1. Elephant.
2. Leopard.
3. Brown Bear.
4. Llama.
5. Rhinoceros.
6. Hyena.
7. Reindeer.
8. Camel.
9. Pelican.
10. Armadillo.
11. Walrus.
12. Boa Constrictor.
13. Chromatrope.
14. Comic: Best London Porter.
15. „ Clown and Ball.
16. „ Punch and Judy.

Roman History.—Box 1.

1. Bronze Wolf.
2. Tarpeian Rock.
3. Tomb of the Curiatii.
4. Map of Rome, showing the Servian Wall and the Seven Hills.
5. Coriolanus.
6. Virginius and his Daughter.
7. Siege of Veii.
8. The Gauls at Rome.
9. Manlius at the Capitol.
10. Passing under the Yoke.
11. Fabricius and Pyrrhus.
12. Environs of Rome.
13. Terrific combat between Manlius and a Gaul.
14. Metius aggravating Titus Manlius.
15. Drummer.
16. Trumpeter.
17. Chromatrope.
18. Comic: Irishman Dancing.
19. „ Cockney Fishing.

Events in Indian History.

1. The Great Mogul delivering to Clive the provinces of Bengal, Bahar, and Orissa.
2. Defeat of Hyder Ali by Sir Eyre Coote.
3. Finding the Body of Tippoo Saib.
4. Maxwell's last charge at Assaye.
5. Group of Sepoys.
6. Wheeler's intrenchment, Cawnpore.
7. Portrait of Sir H. Havelock.
8. Plan of Action near Cawnpore.
9. „ „ near Bithoor.
10. Sketch map to illustrate Havelock's operations.
11. City of Lucknow.
12. Fort of Alum Bagh.
13. Portrait of Sir Colin Campbell (Lord Clyde).
14. Chromatrope.
15. Comic: Sailor and Landsman.
16. „ Harlequin and Ball.
17. „ Dog and Hoop.
18. „ Man carrying Logs.

Historical Places: Cities, Towns, &c.

1. Fortress of the Alhambra.
2. Court of Lions, ditto.
3. Kremlin at Moscow.
4. St. Petersburg; Cathedral of St. Mary of Kasan.
5. Genoa; the Doria Palace.
6. Doge's Palace, Venice.
7. Pisa: Leaning Tower.
8. Temple of Jupiter Olympus, Athens.
9. Corinth.
10. Colosseum at Rome.
11. Bastille, Paris.
12. Tower of London.
13. Shakespeare's House.
14. Chromatrope.
15. Comic: Sailor on Pig.
16. „ Turk's Head.
17. „ Harlequin.
18. „ Soldiers Fighting.

Holy Land.

1. The Dead Sea; encampment.
2. River Jordan; Greek bathing place.
3. Bethlehem.
4. Place of the Nativity.
5. Gaza.
6. Mount Carmel.
7. Tiberias, Town and Lake.
8. Nazareth.
9. Garden of Gethsemane.
10. Pool of Siloam.
11. Jerusalem, Ancient.
12. Holy Sepulchre, Jerusalem.
13. Copernaum.
14. Samaria.
15. Chromatrope.
16. Comic.
17. „

App. XIV. No. 4.

Japan and her People.

1. Map of Japan.
2. The Fudsi or Fousi Yamma.
3. Imperial Palace, Jeddo.
4. Nagasaki.
5. Bay of Simoda.
6. Street in Hakodadi.
7. The Mikado.
8. The Temporal Emperor.
9. A Vassal Prince.
10. Buddhist Temple.
11. Divinities.
12. Civil and Military Costumes.
13. Domestic Life.
14. Japanese Garden.
15. Japanese Wrestlers.
16. Japanese Jugglers and Tumblers.
17. Comic.
18. „
19. „
20. Chromatrope.

Views in London.

1. London, general view.
2. The Thames Tunnel.
3. The Tower.
4. The Custom House.
5. The Monument.
6. The Royal Exchange.
7. The Bank of England.
8. Guildhall.
9. St. Paul's Cathedral.
10. Temple Bar.
11. Somerset House.
12. Trafalgar Square and the National Gallery.
13. Westminster Abbey.
14. Westminster Hall (interior).
15. Houses of Parliament.
16. Chromatrope.
17. Comic: Court Mummers.
18. „ The Drunkard's Cloak.
18. „ The Watchman.
19. „ Man and Woman in the Stocks.

Old London.

1. London Bridge in the olden time.
2. The Lord Mayor's Show.
3. Newgate on fire.
4. St. John's Gate, Clerkenwell.
5. St. Paul's Cross.
6. The Temple Church.
7. The Savoy Palace.
8. Whitehall in the olden time.
9. St. James's Palace Gate.
10. The Almonry, Westminster; Caxton's Printing Office.
11. Lambeth Palace.
12. The Tabard, Southwark.
13. The Knight and the Squire.
14. The Miller, Manciple, and Reve.
15. The Mummers.
16. The Court Fool and Buffoon.
17. Comic.
18. „
19. Chromatrope.

New Zealand.

1. Map of New Zealand.
2. New Plymouth, from the Camp of 40th Regiment.
3. The Moa.
4. New Zealand Chief.
5. Heké and his Wife.
6. War Clubs.
7. Memorial Gods.
8. Native Pah.
9. War Bell.
10. War Canoe.
11. War Speech.
12. War Dance.
13. Chromatrope.
14. Comic.
15. „
16. „

Nursery Tales and Stories.

N.B.—*Any of the following can be had on special Application.*

Box 1.

Whittington and his Cat.
Comical People.

Box 2.

Goody Two Shoes - - - - 8 slides.
Cinderella - - - - - 8 ditto.

Box 3.

Aladdin - - - - - - 12 slides.
Moother Goose, &c. - - - - 4 ditto.

Box 4.

Robinson Crusoe - - - - 12 slides.
Tale of a Tub - - - - - 8 ditto.

Box 5.

Reynard the Fox - - - - 12 slides.
Kasperl and his Adventures - - - 8 ditto.

THE OVERLAND ROUTE.

1. Map to illustrate the Overland Route.
2. Vessel leaving Southampton.
3. The Needles.
4. Cape Trafalgar.
5. Gibraltar.
6. Malta.
7. Alexandria.
8. Mahmoudieh Canal.
9. Grand Cairo.
10. Sphinx and Pyramids.
11. Suez.
12. Aden.
13. Point de Galle, Ceylon.
14. Calcutta.
15. Chromatrope.
16. Comic: Chinaman Dancing.

NATURAL PHENOMENA.—Box 1.

1. Aurora Borealis.
2. Avalanche in the Alps.
3. Mirage in the Desert.
4. Blue Grotto, Isle of Capri.
5. Geysers in Iceland.
6. Falls of Niagara; moonlight.
7. Trajan's Gate in the Balkans; the pass through which the great road from Vienna to Constantinople, by Belgrade and Sophia, runs.
8. Giant's Causeway.
9. Stromboli; Volcano.
10. Mount Vesuvius by night.
11. Natural Bridge, Virginia.
12. Prairie on Fire.
13. Chromatrope.
14. Comic: The Rat Catcher.
15. „ The Mischievous Monkey.
16. „ Clown.

NATURAL PHENOMENA.—Box 2.

1. Earthquake; Lisbon.
2. Grotto of Montserrat.
3. Fingal's Cave.
4. Dropping Well at Knaresborough.
5. Grotto of Antiparos.
6. Falls of Niagara.
7. Aurora Borealis; Reindeer; Esquimaux, &c.
8. Rainbow.
9. Fata Morgana.
10. Icebergs; H.M.S. "Terror" on the ice.
11. Coast of Pembrokeshire, showing the action of the sea on rocks, &c.
12. Castle of Barbarossa, Isle of Capri, Mediterranean.
13. Chromatrope.
14. Vesuvius in eruption.
15. Comic: Clown and Donkey.
16. „ Village Dentist.

App. XIV. No. 4.

Natural Phenomena.—Box 3.

1. Aurora Australis, or Southern Daybreak.
2. Aurora Borealis and Reindeer.
3. Giant's Causeway.
4. Interior of Fingal's Cave.
5. Falls of Niagara, from the Ferry.
6. Vesuvius in eruption.
7. Stromboli; Volcano.
8. Via Mala.
9. Avalanche.
10. Geysers, Iceland.
11. Mirage.
12. Sandstorm in the Desert.
13. Rainbow, and pedestrians in a storm.
14. Chromatrope.
15. Comic: Meet me by Moonlight.
16. „ Outside Passenger.
17. „ Dr. Quack.

Remarkable Plants and Trees.

1. Banian Tree.
2. Date Palm.
3. Cocoa-nut Palm.
4. Talipot Palm.
5. Natives gathering Gutta Percha.
6. Upas Tree, leaf and fruit.
7. Bread-fruit Tree.
8. Baobab Tree.
9. Pitcher Plant.
10. Victoria Regia.
11. Tanghien Tree of Madagascar.
12. Cedars of Lebanon.
13. Chromatrope.
14. Comic: Clown and Pie.
15. „ Monkey and Invalid.
16. „ Clown and Bottle.

Russia and the Russians.

1. Map of Russia.
2. Peter the Great.
3. St. Petersburg.
4. Cathedral of St. Mary, St. Petersburg.
5. Blessing the Waters of the Neva.
6. Ice Hills.
7. Ice Sledges, St. Petersburg.
8. Moscow and the Kremlin.
9. Cronstadt.
10. Archangel.
11. Astrakhan.
12. Sebastopol.
13. Storming of Malakhoff.
14. Warsaw.
15. Cossacks of the Don.
16. Prisoners going to Siberia.
17. Wolf and Russian Traveller.
18. Comic.
19. „
20. Chromatrope.

Views in India.

1. Delhi; the Palace from the river.
2. Great Mosque of Delhi.
3. Ruins of Delhi; Jehungher's Palace.
4. Patna, on the Ganges.
5. Bull Idol at Tanjore.
6. Agra, from the Fort.
7. The Kailassa, Ellora.
8. Skeleton group in the Caves of Ellora.
9. Bejapore, Taj Bowlee.
10. Cawnpore; the Governor's House.
11. Lucknow: Pauj Mahalla.
12. Temple of Elephanta.
13. Calcutta.
14. Chromatrope and Chinese Fireworks.
15. Comic: All Hot.
16. „ Quiet Lodgings.

Life of Wellington.

1. Portrait of Wellington.
2. Battle of Assaye.
3. Oporto.
4. Lines of Torres Vedras.
5. Badajos.
6. Salamanca.
7. Burgos.
8. Vittoria.
9. Pyrenees, Map of.
10. Pyrenees.
11. St. Sebastian; plan of siege.
12. Toulouse.
13. Waterloo; positions on first day.
14. Waterloo.
15. Chromatrope.
16. Comic: Quiet Lodgings.
17. „ Alive and Kicking.
18. „ A Boot Jack.

Sports in the East.

1. The Hog in chase.
2. The Hog at bay.
3. Tiger prowling in a native village by night.
4. Death Spring of a Tiger.
5. Sportsmen surprised by a Tiger.
6. Treeing a Leopard—Elephant Hunt.
7. Bear Hunt on elephant and horseback.
8. Wolf Trap.
9. Leopard attacked by a Boa Constrictor.
10. Kangaroo Hunt in Australia.
11. Chromatrope.
12. Comic: Zouaves fishing for cocks and hens.
13. Chelsea Pensioners.

Wild Sports of the World.

1. War Elephant.
2. Elephant driven into the Corral.
3. The Lion Fight.
4. The Lion and Gladiator.
5. Maldonata and the Puma.
6. The Gorilla.
7. White Rhinoceros; Hunter's Shooting Screen.
8. The Tug of War; Tiger and Alligator.
9. The Downfall; death of the Hippopotamus.
10. Habitat of Leopard.
11. Killing the Panther.
12. The Wolf.
13. The Buffalo.
14. Chromatrope.
15. Comic.
16. „

DIAGRAMS FOR LECTURES.

The Travels and Discoveries of Dr. Livingstone in South Central Africa.

No.

345, 346. Map, showing the route pursued by Dr. Livingstone.
347. The Victoria Falls, on the River Leeambye, or Zambesi.
348. The Traveller's Adventure with a Lion.
349. Trap (or Hopo) and pit for the destruction of Game.
350. Bakalahari Women filling their Egg-shells and Water-skins at a Pool in the Desert.
351. Presentation of two successful Lion Hunters at the Court of Mosilikatse.
352. Reception of the Mission by Shinté, the Balonda Chief.
353. River Scenery on the West Coast.
354. Scenery in Angola, with Euphorbias.
355. St. Paul de Loanda.
356. Rock Scenery at Pungo Andongo.
357. Adventure with Buffaloes.
358. Heads of Natives, and Native with a Marimba, or Musical Instrument.

APP. XIV
No. 4.

On Australia and Australian Life.

No.
122. The Voyage; Table Mountain; Cape of Good Hope.
123. The Arrival; Fort Macquarrie, and Government House, Sydney.
124. Australian Farm; Sheep-washing.
125. Going to the Diggings.
126. Gold Washing at ditto.
127. Escort of Gold; Native Police.
128. Native; Native Hut, &c.
129. Corrobory, or Dance of Natives.
130. Animals.
131. Vegetation.

N.B.—The Hand-book descriptive of the Set is to circulate with the Diagrams.

On China and the Chinese.

No.
68. View of the City of Pekin from the North.
69. View of the City of Canton from the River.
34. Joss House. The Tae-ping Shan at Canton.
12. View of the Island of Hong Kong, showing the Town of Victoria. Joss House in the foreground.
33. Street in Victoria (Hong Kong).
70. Chinese Tiger of War; Soldiers and Mandarin.
18. Buddhist Priest at his devotions, offering gold and silver paper.
13. Scene in a Buddhist Temple. A Missionary preaching.
64. Chinese Funeral Procession.
65. Opium Smoker's Den.
66. Chinese Wedding.
67. Tract Distribution on the Banks of a River.

N.B.—The Book descriptive of the Set is to circulate with the Diagrams.

Domestic Arrangements of the Orientals.

No.
132. Sitting Postures.
133. Seats and Chairs.
134. Ditto.
135. Tables.
136. Washing Hands.

No.
137. Eating.
138. Beds; Sleeping.
139. Grinding Corn.
140. Lamps and Oven.
141. Water and Wine Skins.

Eastern Habitations.

No.
64. Booths made of branches.
65. Progress of Architecture.
66. Windows.
67. Oriental Door.
68. Ground Plan and Section of an Oriental House.

No.
69. Interior of Court of an Oriental House.
70. Roofs.
71. Tents—various.
72. Cave-dwelling.
73. Rock-dwellings in Edom.

On Early English History.

No.
1. Costume of Ancient Britons.
2. British War Chariot and Weapons.
3. Arch Druid, and Group of Druids.
4. Stonehenge.
5. Landing of Julius Cæsar.
6. Caractacus before Claudius.
7. Boadicea haranguing the Confederated Britons.

No.

8. Massacre of the Druids.
9. Heads of Roman Emperors.
10. Britons lamenting the Departure of the Romans.
287. Druid Cromlech.
75. Druid Sacrifice.
M 1. Druids listening to the preaching of the Gospel.

On Ancient Egypt.

176. The Rosetta Stone Inscription.
177. Hieroglyphical Writing form Karnak, Thebes.
222. Thebes, General View of the Ruins of.
223. Heliopolis, the On of Scripture, sole remains of.
252. Map of Ancient Egypt, Nubia, &c.
253. The Hall of Columns, Karnak, Thebes.
254. The Pyramids and Sphinx.
255. The Temple of Aboo Simbel, Exterior of.
256. Ditto, Interior of.
257. The Sitting Statues of Amunoph III. in the Plain of Thebes.
258. The Temple of Edfou, Interior.
259. Tomb of Beni Hassan, Exterior.
260. Tombs of the Kings at Thebes. Interior of Tomb of Psammeticus, discovered by Belzoni.
361. Section, showing construction of Pyramid.

N.B.—The Book descriptive of the Set is to circulate with the Diagrams.

Hindostan and the Hindoos.

Heathen Places of Worship.

52. Exterior of the Great Temple of Siva, at Madura.
53. Interior of the same Temple.
55. Small Temple of Kali, near Madras.
5. Sacred Bull at Chamandi, Mysore.
56. Brahmins. Figures on the left, Worshippers of Siva; figures on the right, Worshippers of Vishnu.

Objects of Worship.

1. Bramah.
2. Vishnu.
3. Siva.
63. The Goddess Kali.
26. The Worship of Genesa, or Pulliar.
27. Serpent Worship.
4. Churning of the Sea.

Modes of Worship.

9. Family on their way to offer Sacrifice.
15. The Churrock Poojah.
6. Self-torture of the Hindoos.

Cruelties of Idolatry.

77. The Suttee; or burning a Hindoo Widow.
28. Death of Hindoos on the banks of the Ganges.

Christian Efforts, &c.

30. Itinerant Preaching in India.
29. Scene at a Christian Village in South India.

App. XIV. No. 4.

No.

10. The Christian Brahmin renouncing Caste.
57. Groups of Hindoos addressed by a Christian Teacher.
31. Contributions of Rice by Native Females in Tinnevelly.

Scenes—various.

62. View of Delhi.
6. Tippoo's Mausoleum.
7. Palanquin Travelling.
16. Procession of Juggernaut.
17. Scenes on the Ganges; the Goddess Kali cast into the Stream, &c.
54. Hindoo School near Madras.

N.B.—The Book descriptive of the Set is to circulate with the Diagrams.

On Progress made in Locomotion.

143. Saxon Chariots.
144. Saxon Waggon, and Lady on Horseback.
145. Ladies Riding.
146. Horse Litter of the Fourteenth Century.
147. State Litter.
148. Travelling Waggon of the Fourteenth Century.
149. Pack Horses and Drivers.
150. Coaches.
151. Ditto.
152. Carriages, various.
153. Modern Stage Coach.
154. Railway Train.—Night.

List of Text Books.

Subjects for Lectures.	Text Books.
1. Views in India -	Murray's Handbook to India. India: The Hindoos (Nattali).
2. Overland Route -	Bradshaw's Overland Route. Eothen (Longman & Co.).
3. South African Animals	Gordon Cumming's South Africa.
4. The Holy Land -	Murray's Handbook to Syria and Palestine. Warburton's Crescent and the Cross. Palestine (Christian Knowledge Society).
5. Natural Phenomena -	Natural Phenomena (Christian Knowledge Society). Caves and Mines of the Earth, Face of the Earth } Religious Tract Society. Curiosities of Physical Geography (Ch. Knight).
6. Astronomy - -	The Orbs of Heaven (198, Strand). Recreations in Astronomy (J. W. Parker).
7. Ancient Cities -	Buckley's Ancient Cities (Routledge). Michell's Ruin of Many Lands (Tegg & Co.) Babylon and Nineveh, Jordan and Idumea, Tyre and Egypt } Religious Tract Society.
8. Natural History: the Habits and Instincts of Animals.	Popular Natural History, by Captain Thomas Brown (Fullerton & Co.). Buckland's Curiosities of Natural History (Bentley).
9. General Views -	Ware's Pictures of European Capitals (Clarke, Beeton, & Co.).
10. The Earth; its Rocks and Fossils.	Page's Advanced Text Book of Geology. Ansted's Ancient World (Van Voorst). Fairy Tales of Science (Griffith & Co.).

Subjects for Lectures.	Text Books.
11. Remarkable Trees and Plants.	Curiosities of the Vegetable Kingdom (Christian Knowledge Society). Plants (Religious Tract Society). Twining's Lectures on Plants (D. Nutt). Popular Geography of Plants (Lovell Reeve).
12. China and the Chinese	Huc's Chinese Empire (Longman & Co.). China and the Chinese (Religious Tract Society). Celestial Empire (Grant & Griffith).
13. Campaigns of Wellington.	Military History of the Duke of Wellington in India (Allen & Co.). Story of Battle of Waterloo (Murray). Life of Wellington.
14. Castles and Abbeys of England, &c.	Minsters and Abbey Ruins of United Kingdom (Stanford). Old Castles of England (Nelson and Son). Old Abbeys of ditto (ditto).
15. Arms, Dress, &c. of Roman, Greek, and British Soldiers.	British Costume (Nattali). Our Engines of War, by Captain Jervis (Chapman & Hall). Gleig's Military History (Parker & Co.).
16. Wild Sports in India -	Markham's Indian Sports. Old Forest Ranger, by Major Campbell (Hall, Virtue, & Co.). Maxwell's Wild Sports (Routledge).
17. The Arctic Regions -	Polar Seas and Regions (Nelson and Son). The Arctic Regions, by Simmonds (Routledge).
18. Ancient and Modern Egypt.	Bishop Russell's Egypt (Nelson & Son). Ancient Egyptians (J. Murray). Egyptian Antiquities (Nattali & Bond).
19. Wild Sports in North America.	Catlin's Life amongst the Indians (Sampson Low, & Co). Gerstaecker's Wild Sports in the West (Routledge).
20. English History -	Cassell's Illustrated History of England, Vols. 1 to 4.
21. Battle Fields and Remarkable Places.	Howitt's Visits to Remarkable Places (Longman & Co.).
22. Fables of Æsop -	Æsop's Fables, illustrated (J. Murray).
23. Events in Indian History.	India: Pictorial, Descriptive, and Historical (Bohn). Clive and Hastings, Traveller's Library (Longman & Co.). Chronicle of the Revolt in India (Chambers). Life of Havelock (Sampson Low & Co.).
24. New Zealand - -	Thomson's New Zealand (J. Murray). Earp's New Zealand (Routledge & Co.). The New Zealanders (Nattali & Bond).
25. *Diagrams* on Australia and Australian Life.	Australia, by W. Hughes (Longman & Co.). Howitt's Two Years in Victoria, cheap edition, 2 vols. in 1 (Longman). Australia: its Scenery, Natural History, &c. } Religious Tract Society. Australia and its Settlements } Religious Tract Society. Home Friend, Nos. 27 to 39, Vol. 2 (Christian Knowledge Society).
26. Historical Places; Cities, &c.	Great Cities of the Middle Ages (Routledge). Irving's Tales of the Alhambra (Bohn). Boy's Own Magazine, Vol. 1 (Beeton). Venice (Religious Tract Society).

App. XIV. No. 4.

Subjects for Lectures.	Text Books.
27. *Diagrams* on Progress of Locomotion.	The Progress of Locomotion: two Lectures (F. Baron, 25, King William Street, Strand).
28. *Diagrams* on China and the Chinese, and Hindostan and the Hindoos.	Book descriptive of China and the Chinese. Book descriptive of Hindostan and the Hindoos (25, King William Street, Strand).
29. *Diagrams* on Egypt -	Egypt; or Hints for Lectures (25, King William Street, Strand). The Egyptian. Ancient Egypt (W. Jones, 56, Paternoster Row).
30. *Diagrams* on the Discoveries of Livingstone.	Livingstone's Travels, cheap edition (J. Murray).
31. Roman History -	Browne's Roman History, Part I. to A.D. 96 (Christian Knowledge Society).
32. Africa and the Africans	Africans at Home, by M'Brair (Longman & Co.).
33. Whittington and his Cat. Jack the Giant Killer Comical People - Cinderella, &c. - Aladdin - -	Comical People (Nelson & Sons). Child's Own Book. Popular Nursery Tales and Rhymes (Routledge).
34. The City Apprentices -	City Apprentices (Christian Knowledge Society). Two Apprentices (Religious Tract Society).
35. Views in London - and	Illustrated Handbook of London (Bohn). London, Ancient and Modern (Religious Tract Society).
36. Old London - -	The Town, by Leigh Hunt (Smith, Elder, & Co.).
37. English History, Box III. 38. English History, Box IV. 39. English History, Box A.	Wars of Roses, by Edgar (Kent & Co., Fleet Street). Cassell's Illustrated History of England.
40. Bible Cities - -	The Old Arm Chair (Christian Knowledge Society). Books on Holy Land. (See No. 4).
41. Eastern Views -	Kelly's Syria and the Holy Land (Chapman and Hall).
42. Bible Mountains, &c. -	Bible Mountains (Christian Knowledge Society). Headley's Sacred Plains (James Blackwood). McLeod's Palestine (Longman & Co.).
43. Wild Sports of the World.	Wild Sports of the World (Beeton, Strand).
44. *Diagrams* on Eastern Habitations.	Eastern Habitations (25, King William Street, Strand).
45. *Diagrams* on Domestic Arrangements.	Domestic Arrangements of the Orientals (25, King William Street, Strand).
46. The Crusades - -	Edgar's Crusades (Kent & Co.).
47. Russia and the Russians	Duncan's Russia.
48. Conquest of Mexico -	Prescott's Conquest of Mexico. Mexico (Christian Knowledge Society).
49. Castles and Abbeys, Box II.	See Books under No. 14.
50. Japan and Her People	Japan Opened (Religious Tract Society). Japan and Her People (Routledge & Co.).

Forms.

App XIV.. No. 4.

Sir,

The Box of Slides and Diagrams named in the margin have been forwarded to-day from this Station to

I have the honour to be,
Sir,

Form 1.

Box of slides On

The following were broken:

Sir,

The Slides and Diagrams named in the margin have been this day received at this Station from

Diagrams— On

Form 2.

The expenses of carriage amounted to

I have the honour to be,
Sir,
Your obedient Servant,

Diagrams— On

Box of slides On

The Secretary,
Council of Military Education,
13, *Great George Street,*
S.W.

General Account of Lectures delivered to the Troops at

From 18 *to* 18

Form 3.

Subjects.	Number of Lectures.	Estimated Number at each Lecture.	If Illustrated, and how.	Lecturers.	Remarks.

The Lectures were given to the following Regiments:—

Form of Notice.

There will be
A LECTURE
ON

ILLUSTRATED BY

AT THE

ON

Evening next, the

Lecturer:

Doors Open at o'Clock.

Admission Free to Soldiers and their Families.

App. XIV. No. 4.

DIRECTIONS FOR USING THE PHANTASMAGORIA LANTERN, &c.

To prepare a single lantern for exhibition, the lamp must be furnished with a cotton wick, and trimmed in the usual manner. In order to supply the lamp with oil, the reservoir must be removed from the cistern, and a small quantity of oil poured into the latter, so as just to fill the hole at the bottom, and well saturate the cotton wick. The moveable reservoir should then be inverted and filled with the *best sperm oil*, and replaced in the cistern. If 1 oz. of powdered camphor is put into a pint of oil, and dissolved by a gentle heat, it will add greatly to its brilliancy. The lamp may then be lighted, and the wick turned up until an intensely bright light without any smoke is obtained. *Before using the lantern, the lenses should be taken out and wiped, so as to remove any dust or moisture that might be on them; the lamp-glass must also be cleaned previous to placing it on the lamp, and care should be taken that the silver reflector is brightly polished.*

The screen or medium upon which the picture is to be shown may consist either of a large linen sheet, or a white wall, if the picture is to be shown *on* the screen; or a fine semi-transparent muslin medium suitably prepared for the purpose may be employed; in which case the picture is to be shown *through* the screen.

The former is the more usual plan, but the latter possesses many advantages, and is therefore preferable. When the thick calico medium is employed, the screen must be wetted with water, and kept in that state during the exhibition; it should be suspended from a beam or frame placed at a convenient distance from the wall, the exhibitor being on one side of the screen, and the spectators on the other. The lantern having been placed at a suitable distance from the screen, say from 8 to 12 feet, according to the size of the lenses, should it not throw a clear and bright disc of light on to the screen or medium, the defect may be corrected by moving the lamp a little back or forward, that is, a little nearer to or farther from the lenses. A clear and well-defined disc can by this means be obtained with facility by the most inexperienced person after a few trials, and when this has been satisfactorily effected, a slide or picture may be put into the groove and "focussed" by carefully moving in or out the brass "nose" or tube in front, until the picture is perfectly clear and distinct. This operation is considerably facilitated by the employment of a rack and pinion motion, whereby the position of the lenses may be instantly adjusted with great nicety.

Dissolving views are exhibited by means of two lanterns, each of which must be prepared in the manner already explained. The two lanterns are then placed side by side on the top of the box, and are secured in their proper places by clamp-screws, so as to prevent them from shifting forward or backward. Clear and well-defined discs of light having been obtained from each lantern, the rack-work dissolving apparatus must be attached to the front of the box, and the dissolving fans fixed on to the end of the rack bar, in such a manner that one of the fans may obscure or obstruct the light from one lantern, while the other fan allows the light from the other lantern to fall on to the screen. *It is necessary to make the discs from both lanterns coincide perfectly on the screen, otherwise the illusion would be incomplete.* Should the edge of one disc show beyond the edge of the other, it may be corrected by moving one of the lanterns slightly sideways, thereby causing it to turn on the clamp screws until both discs are perfectly coincident. The lenses having been "focussed" in the way already explained, the apparatus will be ready for use. Pictures may then be introduced into the slide grooves of both lanterns; but one only of the pictures will be seen on the screen, the other of course being invisible, as it will be hidden by the fan that stands in front of the aperture. When the first picture has been

exposed to view long enough, the exhibitor, from behind the lanterns, must begin to turn the winch of dissolving apparatus slowly, so as to obscure or cut off the light from the first picture and bring forward the second. By thus throwing some of the light from the second lantern on to the first picture, the latter gradually becomes dim or indistinct, and dissolves away slowly; and by continuing the operation, the second picture, by gradual and imperceptible degrees, assumes the place of the first, and comes out on the screen in a clear and distinct manner.

While the spectators are examining the second picture, the first may be removed, and another slide introduced in its place, and the dissolving operation repeated, and so until all the views have been shown. Many beautiful effects may be exhibited, such as falling snow in winter scenes, rainbows, lightning, and other atmospheric phenomena. For these purposes both lanterns must be used together, one to show the view, and the other the effects.

The improved oxygen light is produced by a jet of oxygen gas passing through the flame of a spirit lamp, and impinging against a cylinder of lime. The lamp used is one of the ordinary construction, but with a longer pipe, at the end of which is the burner, holding a small tuft of cotton, which will seldom require renewing, as the flame does not consume it; about an inch from the burner is an upright pin, on which the lime cylinder is placed, the jet through which the oxygen passes being exactly opposite to it. The gas is supplied from a wedge-shaped india-rubber bag, placed between pressure boards, on which is placed a weight of about 30 lbs.; the flexible tube whereby the gas bag is connected with the lantern is provided with a stopcock for regulating or cutting off the supply of gas. The lamp, after being supplied with spirits, is to be placed in the lantern and lighted; then attach the flexible gas tube, and gradually turn on the gas. If the jet of flame does not impinge exactly on the centre of the lime, it may readily be made to do so by turning up the cotton wick with a piece of wire; an intensely brilliant and dazzling light, scarcely inferior to the well-known oxyhydrogen light, will then be produced at one-half the expense, and *without the slightest danger.*

The oxygen gas is made from a mixture of chlorate of potass and the black oxide of manganese, in the proportion of two parts of the former to one part of the latter. A considerable quantity of these ingredients well pulverized may be kept ready mixed, and about 2 lbs. of the mixture will be sufficient to make enough gas to fill the bag, and to exhibit the dissolving views for two hours or more, according to the economy with which the gas is used. The requisite quantity of the ingredients to make the gas is to be placed in the retort, and the connexion between that and the purifier having been made, the retort may be placed on any common fire. After a short time the gas will begin to cover over, and bubble up in the purifier, which must previously be half filled with water. The first bubbles which come over will consist principally of common air; these must be allowed to pass off, but the presence of pure oxygen will be easily ascertained by holding a piece of partly ignited paper to the exit aperture of the purifier, as the pure gas will, if a spark exists on the paper, immediately cause it to burst into flame. The flexible tube should then be attached to the exit aperture of the purifier, and the gas allowed to pass into the bag. When the gas leaves off bubbling in the purifier, it will at once be known that the ingredients are exhausted; the retort should then be taken off the fire, and when cool all the residuum must be removed therefrom, by washing it with cold water, care being taken that the retort *is well dried* before the next operation.

App. XV. No. 1.

Appendix XV.—No 1.

E.H.

CIRCULAR MEMORANDUM.

Addressed to the Army at Home and Abroad.

Genl. No. 290.

Horse Guards, S.W.,
24th March 1864.

Libraries.
1—1864.

A few alterations having been found necessary in the "Regulations for Garrison Libraries and Recreation Rooms," His Royal Highness the Field Marshal Commanding-in-Chief desires, that the enclosed reprint of the Regulations in question be attached to all filed copies of the General Order, No. 823, of the 25th March 1863, and be observed throughout the Army.

By Command of His Royal Highness,
The Field Marshal Commanding-in-Chief,
JAMES YORKE SCARLETT,
Adjutant-General.

Reprint of the Regulations for Garrison Libraries and Regimental Recreation Rooms.

To be attached to G.O., No. 823.

The following regulations having been sanctioned for garrison libraries and regimental recreation rooms, articles 80–91 at p. 264 of the Queen's Regulations and Orders for the Army are hereby cancelled.

Garrison libraries and regimental recreation rooms.

1. Garrison libraries and regimental recreation rooms, open to the troops on payment of a very small subscription, have been established at the principal barracks throughout the United Kingdom and the Colonies.

2. The garrison library constitutes a central depôt, from which books are issued to the several regimental recreation rooms, according to the regulations herein-after stated.

3. Suitable apartments are appropriated and properly fitted up for recreation rooms at the stations where libraries are established, and are to be supplied with fuel and light.

4. Where the construction of the barracks admits of it, there are to be two recreation rooms for each regiment, specially furnished by the Government, and placed under the charge of the regimental librarian, to be used one as a reading room, the other as a room for games; where only one room can be spared for these purposes, it is to be used both for reading and games. A bar for refreshments will be added when practicable.

All requisitions for special furniture, *games*, fuel, and light for the library, recreation rooms, and coffee bar (including crockery, &c. for the latter) are to be transmitted in the usual manner to the quartermaster-general, for the approval of His Royal Highness the Field Marshal Commander-in-Chief, and of the Secretary of State for War, in accord-

ance with Articles 17 & 18 of the Queen's Regulations and Orders for the Army, pages 80–81, *also W.O. Cir. No.* 846, *of 9th December* 1863.

5. The recreation rooms are open to all non-commissioned officers and soldiers of the regiment, being subscribers.

6. The library books are available to the subscribers to the recreation rooms, and to all officers and non-commissioned officers of the garrison, as well as to all persons employed on the civil staff, on payment of subscriptions according to their respective rank and position.

7. The libraries are to be used as reading rooms only by those subscribers who wish to consult books of reference which cannot be circulated generally.

8. Books received from the garrison library are to be circulated by regimental librarians amongst subscribers under regulations drawn up by regimental committees and sanctioned by commanding officers. These books, when no longer required, are to be returned to the garrison library.

Garrison librarian.

9. A garrison librarian, permanent or acting, is to be appointed to take charge of the books and accounts, to issue to the regimental recreation rooms the books required by the several corps, and to examine their state when returned, conforming to all orders with respect to these duties which he shall receive from the officer commanding at the station.

10. All applications relative to the appointment of or allowance to pensioner librarians should be addressed to the Council of Military Education.

11. At stations to which no pensioner librarian has been appointed, the officer commanding is to select a trustworthy non-commissioned officer for the performance of that duty, with payment of 6*d.* per diem defrayed out of the library funds of the several corps at the station. Should there be only one regiment at the station, this non-commissioned officer may also have charge of the regimental recreation rooms, without further remuneration; but where there is more than one corps, the offices in question must be kept distinct. *At very small stations the salary (which is in no case to exceed* 6*d. per diem) may be reduced at the discretion of the officer commanding, according to the number of troops or companies; and when the garrison is a mixed one, there should be only one librarian to act for all.*

12. The garrison librarian is expected to appear in uniform when on duty, and is required at all times to present a clean and respectable appearance, as well as to have the library and his own quarters in perfect order.

13. He is required to attend at the library at such hours as the commanding officer may direct, to receive and exchange books, and to see that the books and other public property in his charge are not misused. It is his duty to call attention to any unusual detention of books by a corps, and to take instructions as to the time to be allowed for the issue of a volume to any corps when its demand renders it necessary to limit such time.

14. Where the construction of the barrack admits of it, a room (adjacent to the library, if practicable) is to be appropriated permanently as a librarian's quarter, and the allowance of a staff non-commissioned officer of the second class may be issued for the same. Where no room can be provided the commuted allowances for lodging, fuel, and light for the same class may be issued in lieu thereof, under Circular No. 13, 1st September 1856. The librarian is not, under any circumstances, to make use of the library as a private quarter.

15. At stations where a non-commissioned officer acts as librarian he will receive the pay provided for in art. 11 of these regulations, from the barrack master, who will charge the same, in proportions fixed by the garrison library committee, to paymasters of corps.

App. XV. No. 1.

16. A regimental librarian is to be appointed in each corps to have charge of the recreation rooms, with such remuneration (provided out of the recreation room funds) as the regimental committee shall, with the approval of the commanding officer, determine.

Regimental librarian.

17. It is to be his duty, in addition to the maintenance of order, regularity, and cleanliness in the recreation rooms, to obtain from the garrison library, at such times as shall be fixed upon by the commanding officer of the station, the books required for the use of the subscribers, and to return to the library those which are no longer required, reporting to the regimental committee, to be appointed as herein-after shown, any damage done to the books, and by whom.

Maintenance of libraries and regimental recreation rooms.

18. For the maintenance of the libraries, and in aid of the regimental recreation rooms, a sum at the rate of 2*l.* 10*s.* per annum for each troop or compnay may be charged quarterly in the regimental pay lists.

19. The books purchased out of the above grant in the manner herein-after stated will belong to the library of the station, but the periodicals, newspapers, and games purchased will become the property of the corps.

20. The proceeds of the above grant, and of the subscriptions of officers, non-commissioned officers, and privates, are to be appropriated by the, regimental committee, with the approval of the commanding officer subject to the following condition, viz., that not less than five shillings per troop or company be appropriated quarterly in advance for the purchase of new books for the library at the station, for the necessary expenses of stationery, and of binding, and for the repairs of books injured by fair wear. *When troops or companies are detached, the contribution of 5s. per quarter is to be paid by such detachments to the library of the station at which they may be serving, and not to the library at the head quarter station. At stations where artillery and engineer libraries are in existence, no payment to the garrison library is to be required from the battery or company allowance. At such places, engineers and artillery will not be permitted to make use of the garrison library; but at other stations those corps should be placed on the same footing as all other branches of the service, and the sum of 5s. per quarter be paid out of the allowance of each battery and company, towards the support of the garrison library, whether the men do or do not avail themselves of the books.*

Subscriptions.

21. The amount of subscription to the regimental recreation rooms is to be decided upon by the regimental committee, subject to the approval of the commanding officer, but is in no case to exceed the following rates, viz.,—

	s.	*d.*	
For an officer - - - - -	1	0	per month
„ serjeant - - - -	0	6	„
„ corporal - - - -	0	4	„
„ trumpeter, drummer, or private	0	3	„

22. The regimental committee is, at the end of each month, to send to the paymaster a list of the names of the subscribers, with their rates of subscription, in order that the respective sums may be stopped from each non-commissioned officer or soldier therein named.

23. All payments are to be made by the regimental paymaster, on the requisition of the regimental committee, countersigned by the commanding officer. It will be at the option of the commanding officer to appoint a treasurer to receive over from the paymaster and apply the sums from time to time acquired.

24. The subscriptions paid by corps to the garrison libraries, agreeably to art. 20 above, are to be received by the barrack master, and disbursed by him on requisitions of the Garrison Library Committee, countersigned by the officer commanding at the station.

25. For the management of the regimental recreation rooms a committee will be formed. The president is to be appointed by the commanding officer, and is not to be under the rank of troop serjeant-major or colour serjeant. The members are to be elected annually by the subscribers, and are to consist of non-commissioned officers and privates in such proportions as the commanding officer shall determine. The duties of the regimental committee are to superintend the regimental recreation rooms as regards management and expense; to recommend for the approval of the commanding officer the books to be purchased for the library of the station, and the periodicals, newspapers, and games to be purchased for the recreation rooms; and to carry into effect the wishes of the subscribers so far as may be possible. Regimental Committee.

26. Commanding officers are to understand, when sanctioning the purchase of new books, that a reasonable proportion of works of an instructive as well as interesting character, such as histories, travels, and general literature, should be obtained. Books, &c.

27. No works of an immoral tendency, or of a political or religious controversial character, can in any case be sanctioned. Any books which, after being purchased, shall be found to be unfit in any respect for circulation, are to be condemned, and forwarded to the Stationery Office as unserviceable; and the corps, out of whose funds they have been provided, is to be required to supply another work of equal value. Any such works are to be ordered by the commanding officer of the garrison to be condemned, and withdrawn from circulation without delay; and any works of an objectionable character are also liable to be condemned by the Field Marshal Commanding-in-Chief, on the report of the Council of Military Education.

28. No donation of books for libraries is to be accepted until the list of them has been approved by the officer commanding at the garrison or station. A list of such books is to be inserted in the quarterly report of the library, as well as of all books purchased out of the library funds.

29. With a view to rendering the books of a religious character contained in the military libraries more freely accessible to the chaplains to the forces, for the use of the sick in hospital, all chaplains to the forces are permitted to take such works out of the military library at their station as they shall require for this purpose without payment of a subscription. The volumes so taken out are to be returned at the proper time, and the soldiers in whose hands they are placed are responsible for their preservation in the same manner as subscribers.

30. It is to be understood that this privilege is not to deprive individuals who are not in hospital of the use of the books when they desire it, in a fair proportion.

31. No newspapers or periodicals are to be admitted into any recreation room which are not sanctioned by the commanding officer, who is required to state in the quarterly report what newspapers and periodicals he has allowed to be admitted.

32. Smoking is sanctioned in recreation rooms, subject to the permission of the commanding officer. Smoking.

33. All gambling is strictly prohibited. Gambling.

34. Subject to the approval of commanding officers, there will be no objection to arrangements for the supply of tea or coffee, bread and butter, or such other articles as they may sanction, at a regulated price; but the introduction of wine, beer, or spirits, under any pretence, is strictly prohibited. Spittoons will be provided on requisition. Tea and coffee.

35. Subject to the approval of commanding officers, the recreation rooms may be kept open till 10½ P.M. in summer, and 10 P.M. in win- Extra hours.

App. XV. No. 1.

ter for men who have received leave specially from their commanding officers to attend after tattoo.

Garrison Library Committee.

36. Where there is more than one corps at a station, a garrison library committee is to be formed, consisting of such number of members of the regimental committees as the officer commanding at the station shall determine.

37. This committee is to meet at least once in each quarter, and compare the lists of books proposed by the several regimental committees to be purchased, reducing, if necessary, those lists, and submitting their final recommendation for the approval of the officer commanding at the station.

38. It is to examine the quarterly statement of accounts prepared by the librarian, previously to its being submitted to the quarterly board of officers.

Damages.

39. The barrack master, assisted by an officer of the troops, not under the rank of captain, and accompanied by the quartermasters of the different corps in garrison, is to make a minute monthly inspection of the books ~~and games~~ *not then in circulation* belonging to the Government, for the purpose of ascertaining the losses sustained, and damage done, either designedly or through neglect, during the month immediately preceding, and of assessing the charges for the same; and a similar inspection is to take place at every movement or interchange of troops.*

40. Should the barrack master and the officer commanding disagree as to the amount to be charged to the troops, the same course is to be adopted as for barrack damages under similar circumstances.

41. Statements of the charges assessed are to be attested by the barrack master and the officer who has assisted him at the inspection; and these statements are to be transmitted to the Paymasters of the regiments and depôts, with a view to the amount being recovered from the non-commissioned officers and men at their next settlement.

42. No charges are to be made for damage arising from fair wear and tear; and the inspecting officers above referred to may exercise their discretion in awarding the charge to be made against a corps for the loss of or damage done to a book ~~or game~~ whenever it shall be satisfactorily shown that it has been the result of accident and not of design; but in the latter case the full amount of damage should be recovered from the soldier committing it.

Repairs.

43. All repairs, under fair wear and tear, required for the books ~~or games~~ are to be reported quarterly to the commanding officer, who will authorize the same to be carried out under the direction of the barrack master, and the expense to be defrayed by the library fund.

Books condemned.

44. Books condemned as unserviceable are to be forwarded to the Stationery Office. They may be sent direct from stations in Great Britain. At all other stations they are to be made up into convenient parcels, and sent to the Military Store officer, by whom they will be forwarded to Woolwich by government freight ships as opportunities offer.

45. Games, furniture, and utensils supplied at the public expense are to be considered as barrack stores, and are, together with the rooms, to be inspected, and any damages or deficiencies to be assessed and made good without delay, according to the barrack regulations. The amount assessed is to be recovered from the troops in the usual manner, the charges being

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* In every case in which a single volume is lost or injured, unless the work be one of which the volumes are procurable separately, the whole set must be charged for, and the other volumes will become the property of the soldier.

paid from the funds of the recreation rooms, when they cannot be assessed against individual soldiers.

46. Fair wear and tear repairs are to be performed in the usual manner, but are to be separately shown in the ordinary returns and accounts.

47. Articles requiring to be replaced from fair wear and tear, or additional articles required, will be supplied at the public expense, on the requisition of the commanding officer to the barrack master, subject in each case to the approval of the Secretary of State.

Transfers.

~~45.~~ *48.* On a regiment quitting a station all books are to be returned to the library, and all accounts connected with the library settled *three days* before the departure of the regimental head quarters.

~~46.~~ *49.* Should a regiment quit a station suddenly the same course is to be adopted as for barrack damages under similar circumstances.

~~47.~~ *50.* Should a station be unoccupied by troops the library is to be under the care of the barrack master; and if a pensioner librarian be employed he is to be under the orders of the barrack master.

Council of Military Education.

~~48.~~ *51.* The Council of Military Education have the general supervision of military libraries.

Quarterly Reports.

~~49.~~ *52.* Boards of officers (of which the barrack master will be one) are to report quarterly to the Council of Military Education on the state of the library, according to the Form B. annexed.

~~50.~~ *53.* Quarterly reports on regimental recreation rooms, according to the annexed Form A., are to be forwarded in duplicate from each corps, addressed to the Secretary to the Council of Military Education, 13, Great George Street, Westminster, who will transmit the same, with such observations as the council may have to offer, for the consideration of H.R.H. the Field Marshal Commander-in-Chief and the Secretary of State for War.

Inspecting General's Report.

~~51.~~ *54.* General officers at their periodical inspections of the troops are to report upon the state of the different libraries and the regimental recreation rooms within their commands, as well as on the degree of attention paid to them by the librarians, submitting such suggestions as they may deem necessary for their improvement, and stating the number of subscribers in each of the corps under their command.

N.B.—In this reprint the new matter is inserted in italics, the words intended to be omitted being struck through.

App. XV
No. 1.

W. O. Form 208.

A.

Report of the Recreation Rooms of the _____ Regiment stationed at _____, for the quarter ending _____ 18___.

(*To be rendered in Duplicate.*)

1. State the number of Subscribers, Officers, Non-commissioned Officers, and Privates, separately, and the amount of the monthly subscription of each rank.	Month.	Officers.	Serjeants.	Corporals.	Privates	Per Month.
						Officers, at
						Serjeants, at
						Corporals, at
	Total					Privates, at
2. The names of the games, periodicals, and newspapers purchased for the Recreation Rooms during the quarter.						
The number and description of games in possession of the regiment.						
3. The salary per month of the Librarian.						
4. How the Committee is composed.						
5. Whether there is a room for Games as well as a Reading Room; and the hours during which such rooms are kept open.						
6. Whether refreshments are provided.						
7. Append a statement of account for the quarter in detail. Form annexed.						

_____,

Treasurer (or President of the Regimental Committee).

Confirmed _____,

Commanding _____

APP. XV. No. 1.

STATEMENT of ACCOUNTS of the RECREATION ROOMS of the_____ stationed at_____ for the Quarter ending_____18___.

Receipts.	£	s.	d.	Payments.	£	s.	d.
Balance last quarter -				Balance last quarter -			
Government Allowance, at 12*s.* 6*d.* per Troop, Battery, or Company, per quarter - -				Contributions to Garrison Library, at* per Troop, Battery, or Company - - -			
Subscriptions for the quarter - - -				Paid for Newspapers and Periodicals - - -			
				Purchase, or repair of Games - - -			
				Pay of Regimental Librarian - - -			
				Contribution towards Pay of Garrison Librarian -			

President of Committee.

* Not less than 5*s.* per Troop, Battery, or Company.

App, XV.
No. 1.

(*To be rendered in Duplicate.*)

W. O. Form 207.

B.

QUARTERLY REPORT of the GARRISON LIBRARY at_____

_____ 18

1. State the number of Troops, Batteries, and Companies at the Station.	Cavalry_____Troops. Artillery_____Batteries. Engineers_____Companies. Infantry_____Ditto. Other Corps_____
2. State the number of Works composing the Library - - - Ditto Volumes ditto Ditto ditto issued to each Corps during the Quarter -	
3. State on next page the names of all Books purchased during the Quarter, and of those requiring repair.	
4. Whether all repairs, binding, &c., noted in the last report have been executed. Specify on the next page any exceptions, and state the cause.	
5. State on next page the names of any books condemned as unserviceable, and whether from fair wear, or chargeable against Troops.	
6. The Name and Salary of the Librarian, and date of Appointment, and whether he gives satisfaction.	
7. Append a statement of accounts for the Quarter in detail. Form annexed.	

Signature of Board,

_____

_____

_____, Barrack Master.

Confirmed_____,

Commanding Garrison.

STATEMENT of Books Purchased, Repaired, requiring Repairs, or Condemned as Unserviceable. APP. XV. No. 1.

STATEMENT of ACCOUNTS of the GARRISON LIBRARY for the Quarter ending _____ 18___.

Receipts,	£	s.	d.	Payments.	£	s.	d.
Balance last Quarter_____							
Contributions from Regiments				Purchase of Books_____			
				Binding and Repairs___			
_____Regiment_____				Pay of Librarian_____			
_____Regiment_____							
_____Regiment_____							
_____Regiment_____							
Amount received for Books lost or damaged.							
Amount received for Librarian's Salary_____							

_____ Librarian.

Examined by the Committee and found correct.

_____

President of Garrison Library Committee.

App. XV. No. 2.

Appendix XV.—No. 2.

LIST OF GARRISON LIBRARIES, 1863-4.

Garrison Libraries.

Stations.	No. of Companies.	No. of Volumes.	No. of Volumes circulating last Quarter.	Contributions last Quarter. £ s. d.
Aberdeen	6	860	889	3 15 6
Alderney	3	406	270	0 15 0
Aldershott, North Camp	30	1,296	2,460	7 10 0
„ South Camp	94	4,695	6,129	23 10 0
Athlone	11	1,474	1,616	5 11 5
Ayr	3	325	275	2 18 4
Bahamas	2	738	-	2 15 0
Ballincollig	2	738	1,050	2 15 0
Barbadoes	8	2,385	672	4 6 0
Bathurst	3	521	-	2 5 11
Belfast	13	1,495	1,095	5 10 6
Birmingham	2	717	398	2 17 9
Birr	14	1,694	3,801	7 0 0
Brighton	6	391	175	1 10 0
Buttevant	10	1,551	937	6 6 6
Cahir	4	681	623	3 6 3
Canterbury	11	2,382	1,727	5 0 0
Chatham	49	4,724	400	10 10 0
Clonmel	1	552	456	4 6 4
Colchester	42	1,875	875	17 7 0
Cork	17	1,654	1,847	6 10 6
Coventry	3	369	-	2 15 0
Corfu, June 1863	-	424	-	8 16 0
Cephalonia	6	569	534	1 2 9
Curragh, West Camp	26	3,093	860	6 10 0
Demerara	3	957	790	3 10 1
Devonport	21	3,416	996	5 5 0
Dorchester	1	468	235	2 16 7
Dover, W. Heights	21	2,418	790	5 5 0
Dublin, Royal Barracks	71	7,447	2,159	17 15 0
Dundalk	6	487	-	1 1 5
Edinburgh Castle	10	1,411	1,627	3 0 0
„ Piers Hill	4	981	330	1 0 0
Enniskillen	4	825	570	3 19 0
Fermoy	30	2,883	1,618	9 15 6
Fort George, N.B.	Det.	479	78	—
Fredricton, N. Brunswick	5	830	740	1 5 0
Gibraltar	50	3,518	942	17 2 1
Glasgow	5	1,607	-	3 10 6
Guernsey	3	1,176	403	0 15 0
Halifax, Cidadel	10	1,178	1,247	16 7 4
„ South Barracks	10	1,101	-	6 16 8
Hamilton, C. W.	3	521	412	6 7 0
Hong Kong	11	2,370	758	6 11 6

Station.	No. of Companies.	No. of Volumes.	No. of Volumes circulating last Quarter.	Contributions last Quarter. £	s.	d.
Horfield		794	—		—	
Hounslow	6	602	250	4	6	5
Ipswich	3	615	295	3	13	1
Isle of Man	Det.	486	250	0	8	6½
Jersey	5	1,074	960	3	10	6
Kilkenny	6	925	841	1	10	0
Kingston, Canada West	12	1,247	469	3	0	0
Languard Fort	Det.	60		1	3	0
Leeds		291	—		—	
Limerick	13	2,538	2,096	5	9	7
Liverpool, 30th Sept. 1863		343		2	3	0
London, Tower		427		2	11	9
„ C. W.	15	1,009	1,262	4	15	6
Longford	3	522	241	1	9	0
Maidstone	4	696	399	2	9	9
Manchester, Hulme	6	771	849	2	15	9
„ Salford, June 1863	9	535		8	5	5
Mauritius	20	1,841	509	7	6	0
Melbourne	1	763	180	2	18	0
Montreal	51	2,109	1,637	12	15	0
Naas		121	—		—	
Newbridge	11	1,095	851	7	3	6
Newcastle		764	—		—	
„ Jamaica	7	1,008	779	4	0	6
Newry	6	730	815	3	15	6
Norwich	3	590	186	9	3	5
Paisley	2	531	207	1	0	0
Parkhurst	14	2,008	1,937	5	17	6
Pembroke	15	1,914	2,370	6	0	0
Perth	3	528	439	2	5	4
Portsmouth	48	5,882	2,800	9	15	0
Preston	14	1,321	1,683	10	15	0
Quebec	20	1,776	575	7	5	6
Sheffield	7	843		4	0	6
Shorncliffe	23	2,904	1,496	5	15	0
Spike Island	Det.	737	485	2	1	9
Stirling	8	1,362	1,151	2	0	0
St. John, New Brunswick	6	915	1,340	6	18	10½
St. John's, Newfoundland	2	500	457	1	12	4
Templemore	12	1,468	1,452	6	15	6
Toronto, Canada W.	14	1,185	664	5	16	1
Trinidad	3	1,170	719	0	15	0
Tynemouth		451	—		—	
Walmer	12	1,275	1,381	6	0	0
Warley	5	3,463	1,971	3	10	6
Waterford	4	981	215	4	0	3
Weedon	6	1,018	794	3	15	0
Winchester	16	1,713	1,652	4	0	0
Woolwich, Hut Barracks	4	474	80	1	0	0
York	8	1,358	1,147	4	5	6
Zante	4 Cos. Det.	820	352	10	13	7
		123,030	79,020	471	10	10

App. XV. No. 2.

Royal Artillery Libraries.

Station.	No. of Companies.	No. of Volumes.	No. of Volumes circulating last Quarter.	Contributions last Quarter. £	s.	d.
Alderney	1	315	—		—	
Aldershot	2	588	—		—	
Barbadoes		806	—	3	15	0
Bermuda	1	449	189	5	12	10
Corfu	—	—	—		—	
Dover	—	—	—		—	
Dublin		1,540	—		—	
Gibraltar	8	2,044	4,374		—	
Halifax, N.S.	3	1,512	975	9	0	0
Jersey	1	542	191	2	17	6
Leith Fort	1	730	296	0	5	0
Malta	—	—	—		—	
Mauritius		702	—		—	
Quebec		996		10	16	10
Plymouth	7	1,301	1,690	9	5	0
Portsmouth		563	—		—	
Sheerness		1,256	—		—	
Shoeburyness	1 & 2 Det.	696		5	5	0
Shorncliffe		902	—		—	
Tynemouth Castle		523	92		—	
Woolwich, Non-Commissioned Officers.		5,937	4,540	35	5	7
Woolwich, Gunners	23	4,060	6,180	34	11	11
		25,462	18,527	116	14	8

Royal Engineers' Libraries.

Auckland, New Zealand		43		0	18	9
Bermuda	1	449	—		—	
Chatham	—	—	—		—	
Corfu		428	—		—	
Dublin	2	3,095		4	12	10
Fremantle, Australia	—	—	—		—	
Glasgow	—	—	—		—	
Halifax, N.S.	—	—	—		—	
King William's Town	—	—	—		—	
London	—	—	—		—	
Mauritius	2	664		7	13	7½
Perth		522	176	2	19	6½
Shorncliffe	—	—	—		—	
Southampton	4	1,341		35	5	4
Woolwich	1	412	68	1	14	6
		6,954	244	53	4	7
Add Artillery		25,462	13,527	116	14	8
Add for Garrison		128,030	79,020	471	10	10
		160,446	92,791	641	9	1

Appendix XV.—No. 3.

App. XV. No. 3.

List of Regimental Recreation Rooms according to the latest Quarterly Report.

Regiments.	Where Stationed.	Number of Rooms.	Refreshments.	Number of Subscribers.
1st Life Guards	No Recreation Room Return.			
2nd "				
Royal Horse Guards				
1st Dragoon Guards	India.			
2nd "				
3rd "				
4th "	Dundalk	2	Yes	241
5th "	Cahir	1	Yes	205
6th "	Aldershot	2	Yes	428
7th "	India.			
1st Dragoons	Aldershot	2	Yes	380
2nd "	Birmingham	L	No	113
3rd Hussars	Edinburgh	1	Yes	171
4th "	Island Bridge	None established.		
5th Lancers	India.			
6th Dragoons				
7th Hussars				
8th "				
9th Lancers	Brighton	1	No	315
10th Hussars	Dublin	1	Yes	170
11th "	Dublin	1	No	83
12th "	Hounslow	1	Yes	245
13th "	Aldershot	2	Yes	409
14th "	Manchester	1	No	205
15th "	——	—	—	—
16th Lancers	York	2	Yes	403
17th "	India.			
18th Hussars	Norwich	1	No	284
19th "	India.			
20th "				
21st "				
1st Military Train	Woolwich	1	Yes	222
2nd "	Aldershot	2	No	205
3rd "	——	—	—	—
4th "	——	—	—	—
5th "	Aldershot	1	Yes	130
6th "	Curragh	1	Yes	154
Grenadier Guards, 1st Batt.	Montreal	1	Yes	392
" " 2nd "	London	1	No	None.
" " 3rd "	Windsor	2	Yes	509
Coldstream Guards, 1st "	London	L	No	None.
" " 2nd "	London	1	No	250
Scots Fusil. Grds., 1st "	London	2	No	648
" " 2nd "	Montreal	1	Yes	492
1st Foot, 1st Batt.	India.	No Return.		
" 2nd "				
2nd Foot, 1st "	Devonport	2	Yes	469
" 2nd "	Gibraltar	2	No	645

App. XV. No. 4.

Regiments.	Where Stationed.	Number of Rooms.	Refreshments.	Number of Subscribers.
3rd Foot, 1st Batt.	Aldershot	2	Yes	265
„ 2nd „	Gibraltar	1	Yes	575
4th Foot, 1st „	India.			
„ 2nd „	No Recreation Rooms.			
5th Foot, 1st „	Shorncliffe	1	No	341
„ 2nd „	—	—	No	—
6th Foot, 1st „	Aldershot	1	Yes	395
„ 2nd „	—	1	Yes	—
7th Foot, 1st „	India.			
„ 2nd „	—	1	Yes	594
8th Foot, 1st „	Sheffield	2	No	216
„ 2nd „	Malta	2	No	294
9th Foot, 1st „	Cephalonia	1	Yes	261
„ 2nd „	No Recreation Rooms.			
10th Foot, 1st „	Kilkenny	1	No	161
„ 2nd „	—	1	Yes	—
11th Foot, 1st „	Dublin	2	No	61
„ 2nd „	Cape of Gd. Hope	1	No	275
12th Foot, 1st „	——	—	—	—
„ 2nd „	—	1	No	193
13th Foot, 1st „	India.			
„ 2nd „	Mauritius	2	Yes	467
14th Foot, 1st „	Jamaica	1	Yes	184
„ Detachment	—	1	Yes	—
„ 2nd Batt.	No Return.			
15th Foot, 1st „	St. John's, N.B.	2	No	288
„ Detachment	Fredericton	2	No	200
„ 2nd Batt.	Gibraltar	3	Yes	403
16th Foot, 1st „	Toronto, C.W.	1	No	307
„ 2nd „	Halifax, N.S.	L	No	180
17th Foot, 1st „	Quebec	2	Yes	—
„ 2nd „	Halifax	L	No	360
18th Foot, 1st „	India.			
„ 2nd „	New Zealand.			
19th Foot, 1st „	India.			
„ 2nd „				
20th Foot, 1st „				
„ 2nd „				
21st Foot, 1st „	Barbadoes	1	Yes	372
„ Detachment	Demerara	L	No	50
„ 2nd Batt.	India.			
22nd Foot, 1st „	Malta	1	Yes	306
„ 2nd „	Malta	2	Yes	292
23rd Foot, 1st „	India.			
„ 2nd „	Gibraltar	1	Yes	327
24th Foot, 1st „	Aldershot	3	Yes	361
„ 2nd „	Mauritius	1	No	206
25th Foot, 1st „	Malta	1	Yes	536
„ 2nd „	—	1	Yes	—
26th Foot	Portsmouth	1	No	263
27th „	India.			
28th „				
29th „	Dublin	1	No	230
30th „	Montreal, C.E.	—	No	231
31st „	Devonport	2	No	187
32nd „	Dublin	1	No	329
33rd „	India.			

Regiments.	Where Stationed.	Number of Rooms.	Refreshments.	Number of Subscribers.
34rd Foot - - -	India.			
35th ,, - - -				
36th ,, - - -				
37th ,, - - -	Aldershot -	3	Yes	368
38th ,, - - -	India.			
39th ,, - - -	St. George's, Bermuda.	5	Yes	239
40th ,, - - -	New Zealand			
41st ,, - - -	Glasgow - -	2	No	118
42nd ,, - - -	India.			
43rd ,, - - -				
44th ,, - - -				
45th ,, - - -	Curragh - -	1	No	245
46th ,, - - -	India.			
47th ,, - - -	Kingston, C.W.	1	No	264
48th ,, - - -	India.			
49th ,, - - -	Manchester -	1	No	219
50th ,, - - -	- - -	1	No	—
51st ,, - - -	India.			
52nd ,, - - -				
53rd ,, - - -	Portsmouth -	L	Yes	317
54th ,, - - -	India.			
55th ,, - - -				
56th ,, - - -				
57th ,, - - -	New Zealand.			
58th ,, - - -	Newry - -	1	No	177
,, ,, Detachment -	Enniskillen -	1	No	103
59th ,, - - -	Aldershot -	1	No	376
60th Rifles, 1st Batt. -	Tower - -	1	No	262
,, 2nd ,, -	Aldershot -	2	Yes	417
,, 3rd ,, -	India.			
,, 4th ,, -	Montreal - -	1	Yes	284
61st Foot - - -	Jersey - -	1	Yes	149
,, Detachment -	Alderney - -	1	No	94
,, ,, -	Guernsey - -	1	No	59
,, ,, -	Jersey - -	1	No	62
62nd Foot - - -	Quebec - -	1	Yes	518
63rd ,, - - -	London, C.W. -	1	No	294
64th ,, - - -	Gosport - -	2	Yes	288
65th ,, - - -	India.			
66th ,, - - -				
67th ,, - - -	New Zealand.			
68th ,, - - -	India.			
69th ,, - - -				
70th ,, - - -	New Zealand.			
71st ,, - - -	India.			
72nd ,, - - -				
73rd ,, - - -	Aldershot -	1	No	264
74th ,, - - -	India.			
75th ,, - - -	Aldershot -	2	Yes	360
76th ,, - - -	India.			
77th ,, - - -				
78th ,, - - -	Dover - -	2	No	502
79th ,, - - -	India.			
80th ,, - - -				
81st ,, - - -				
82nd ,, - - -				

App. XV. No. 3.

Regiments.	Where Stationed.	Number of Rooms.	Refreshments.	Number of Subscribers.
83rd Foot	Shorncliffe	1	No	251
84th „	Curragh	2	No	345
85th „	Dover	1	No	167
86th „	Dublin	2	No	211
87th „	Aldershot	2	No	239
88th „	India.			
89th „				
90th „				
91st „				
92nd „	Edinburgh	2	No	232
93rd „	India.			
94th „				
95th „				
96th „	Cape.			
97th „	India.			
98th „				
99th „	Hong Kong	2	Yes	926
100th „		4	Yes	619
101st „	India.			
102nd „				
103rd „				
104th „				
105th „				
106th „				
107th „				
108th „				
109th „				
Rifle Brigade, 1st		No Recreation Room established.		
„ 2nd	India.			
„ 3rd				
„ 4th	Gibraltar	2	Yes	
West India Regiments, 1st		None established.		589
„ „ 2nd	Demerara	L	No	
„ „ 3rd	Sierra Leone.			10
„ „ 4th		1	Yes	—
„ „ 5th		No Recreation Room established.		
Ceylon Rifles		1	No	152
Cape Mounted Rifles		1	No	—
Royal Canadian Rifles	London, C.W.	1	No	88
„ „ Detach.	St. John's, Newfoundland.	1	No	91
Malta Fencibles		None established.		
Commissariat Staff	Aldershot	1	No	116
Depôt Battalions, 1st	Chatham	These depôt battalions subscribe to the Institute.		
„ 2nd				
„ 3rd				
„ 4th	Colchester	2	Yes	380
„ 5th	Parkhurst	2	No	401
„ 6th	Walmer	1	No	278
„ 7th	Winchester	2	No	301
„ 8th	Pembroke	1	Yes	419
„ 9th	Colchester	1	Yes	169
„ 10th	Colchester	1	Yes	256
„ 11th	Preston	2	Yes	319
„ 12th	Athlone	2	Yes	430

Regiments.	Where Stationed.	Number of Rooms.	Refreshments.	Number of Subscribers.
Depôt Battalions, 13th -	Birr - -	2	Yes	397
,, 14th -	Belfast - -	2	Yes	207
,, 15th -	Buttevant - -	2	No	213
,, 16th -	Templemore -	2	Yes	231
,, 17th -	Limerick - -	2	No	265
,, 18th -	Fermoy - -	2	Yes	274
,, 19th -	Fermoy - -	2	Yes	247
,, 20th -	Cork - -	2	No	222
,, 21st -	—	—	—	—
,, 22nd -	Stirling.			
,, 23rd -	Aberdeen -	1	No	144
Cavalry Depôts :				
Canterbury - - -	Canterbury -	2	Yes	453
Maidstone - - -	Maidstone -	L	No	104
Depôt 74th Foot - -	Perth - -	1	No	80
Schools of Musketry :				
Hythe - - - -	- - -	None established.		
Fleetwood - - -	Fleetwood -	1	No	122
Tilbury Fort - -	Tilbury Fort -	1	No	88
Royal Artillery.				
Horse Brigade - - -	Canterbury -	2	Yes	269
,, - - -	Woolwich.			
Depôt Brigade, 1st Division	Sheerness.			
,, 2nd ,, -	Woolwich - -		No	—
,, 3rd ,, -	Warley - -	2	Yes	360
Brigades, 1st - - -	Gibraltar - -	1	No	480
,, 2nd - - -	Dover - -	L	No	283
,, 3rd - - -	Malta - -	3	Yes	—
,, 4th - - -	Aldershot - -	1	No	233
,, 5th - - -	Plymouth -	2	Yes	407
,, 6th - - -	*See* Portsmouth.	1	No	239
,, 7th - - -	Fort Brockhurst			
,, 8th - - -	*See* Dublin.			
,, 9th - - -	Shorncliffe -	1	No	—
,, 10th - - -	Montreal.			
,, 11th - - -	India.			
,, 12th - - -	Mauritius - -	L	No	141
,, 13th - - -	*See* Woolwich.			
,, 14th - - -	India.			
,, 15th - - -	Halifax, N.S. -	1	No	—
,, 16th - - -	India.			
Detached Batteries.				
	Curragh - -	- -	No	—
	Alderney - -	1	No	57
	Aldershot -	—	—	—
	Athlone - -	- -	No	51
	Ballincollig -	L	No	164
	Barbadoes -	1	No	57
	Bermuda - -	1	—	—
	Cork - - -	None established.		
	Chatham - -	Subscribes to the Institute.		
	Clonmel - -	None established.		

App. XV. No. 3.

Regiments.	Where Stationed.	Number of Rooms.	Refreshments.	Number of Subscribers.
	Corfu	2	No	209
	Dorchester	1	No	90
	Portobello Barracks, Dublin	L	No	58
	Devonport	1	No	111
	Fort George	1	No	19
	Guernsey	1	No	82
	Gosport	—	—	—
	Fort Brockhurst	1	No	98
	Blockhouse	1	No	44
	Fort Grange	1	No	63
	Fort Monkton	1	No	65
	Halifax, N.S.	1	No	148
	Hong Kong	—	—	—
	Hamilton, C.W.	1	No	109
	Jersey	1	No	50
	Jamaica	1	No	—
	Kingston, C.W.	1	No	153
	Leith Fort	1	No	113
	Limerick	1	No	140
	London, C.W.	1	No	167
	Montreal	—	—	—
	Newbridge	1	No	113
	Pembroke	1	Yes	96
	Quebec	2	Yes	140
	Sheerness	2	Yes	—
	Shoeburyness	1	No	115
	St. Helena	—	—	—
	St. John's, N.B.	—	—	—
	Toronto	1	No	111
	"	1	No	—
	Tynemouth	1	No	20
Non-com. officers Gunners	Woolwich	—	No Yes	839 675
Total				2,529
Royal Engineers.				
	Aldershot	—	—	—
	Bermuda	1	No	87
	Chatham	2	Yes	224
	Corfu	—	—	—
	Curragh	—	—	—
	Dublin	1	No	7
	Gibraltar	—	—	—
	Halifax, N.S.	L	No	210
	Malta	—	—	—
	Montreal	—	—	—
	Portsmouth	—	—	—
	Shorncliffe	2	No	78
	Southampton	1	No	83
	Woolwich	1	No	61
Total				750

Appendix XV.—No. 4.

Sir, Canterbury, July 13, 1864.

In forwarding for the information of the Council of Military Education the accompanying reports on the reading and recreation rooms of the garrison under my command, I beg to state that both Colonel Henry and myself considered the Rev. Mr. Maynard, chaplain to the forces, the proper person to draw them up, as he has taken the greatest interest not only in carrying out the rules and regulations so successfully established, but also in drawing them up, for which, and his zeal on all occasions, he is entitled to my warmest thanks.

These reports contain every observation I have to make on the subject, except that I am not prepared to recommend the issue of beer to the men at the bar of the recreation room.

I am certain it would be very difficult, I may say impossible, to prevent irregularity not only amongst the men of the depôt generally, but also on the part of the non-commissioned officer in charge, who would by the issue of drink be subject to the temptation of making money by the sale of liquor generally in the barracks to non-subscribers, which I know from my experience in the case of serjeants' messes few non-commissioned officers can resist.

I have, &c.

The Secretary to the Council of Military Education, &c. &c. &c.

(Signed) M. Custance, Colonel Commandant.

Depôt Brigade Office, Royal Horse Artillery,

Sir, Canterbury, June 12, 1864.

I beg to transmit the enclosed report from the chaplain to the forces, who has taken great pains and shown much interest in the subject. I concur in his recommendations with the exception of that portion which relates to the issue of beer at the bar of the recreation room. It will be very desirable to grant another barrack room as an additional recreation room, as I do not think the present accommodation will suffice for the winter months.

I have, &c.

(Signed) C. S. Henry, Lieut.-Col., Commanding Depôt Brigade R.H.A.

The Secretary to the Council of Military Education, Great George Street.

Sir, Canterbury, June 1864.

In obedience to your request and that of Colonel Henry, commanding the Royal Horse Artillery depôt, I have the honour to submit, for the information of the Council of Military Education, the following account of the garrison library and recreation rooms of the Cavalry and Royal Horse Artillery depôts at Canterbury, and their present results.

I abstain from giving such information as may be learnt from the quarterly reports, and confine myself to a *general description* of the garrison library and recreation rooms.

Of the Garrison Library.

The garrison library contains 2,414 volumes. In all respects it may be considered a very excellent library. *Special* classified catalogues have

App. XV. No. 4.

been made of it, and are sold to the troops at 2*d.* per copy. The principle of classification and number of volumes in each class is as follows :—

Class.	No. of Volumes.
A. Books of reference	50
B. Biography	225
C. Military and naval	223
D. Voyages and travels	313
E. Entertainment and fiction	453
F. Poets and poetry	81
G. General literature	525
H. Science and natural history	148
I. Sacred and serious subjects	154
K. Magazines and periodicals	202
*** Books to assist in the preparation of lectures, but which are not taken out of the library without special permission of the commandant	40
	2,414

The books mostly read are taken from Class E. (entertainment and fiction); then Class D. (voyages and travels), and many are also taken from classes F. (poetry), and G. (general literature). The greater number of the subscribers to the library ask for those books which they have seen their comrades reading, but it is hoped that by the introduction of the catalogues mentioned before, they will be led to extend their choice, and select books for themselves. The system of supplying each recreation room with a quantity of books, issued from the garrison library at various times, has not been found to work well; for many books would be lying unread in one recreation room whilst asked for and required in the other, and those books that *were* read would be returned eventually in such a state of wear and tear from constant circulation as to be unfit for further use. The plan now adopted here is to allow the subscribers to the recreation rooms themselves to take from and return to the garrison library such books as they may require, the garrison librarian supplying the depôt librarians respectively with monthly lists of their officers and men who have taken books from the library during the month. By this system of returning books directly to the garrison library, a book is removed from circulation as soon as it is discovered to be damaged, and as all the binding and repairs of our library are done in the library itself by a soldier of the Cavalry depôt, the damage, however slight, is repaired at once, and the book saved from being prematurely condemned. The bookbinding being also in our own hands, the charges against the Garrison Library Fund on this account and for repairs are very much reduced, leaving us a larger amount to be expended in the purchase of new works. From these considerations and others, I venture to suggest whether it might not add to the inducements already afforded to the soldiers to become subscribers to a recreation room, by abolishing garrison libraries, and making regimental libraries in their stead. The expense of paying a garrison librarian would be saved, and an enlarged sense of proprietorship extended among the subscribers.

Of the Royal Horse Artillery Depôt Recreation Room.

This consists of two barrack rooms and a serjeant's quarter on the ground floor. The left-hand room on entering is the reading room, and is furnished with tables, chairs, and large settees. The floor is covered

with cocoa-nut matting, and spittoons are supplied. Window curtains and blinds have been added at the expense of the subscribers. On the walls are several maps, pictures framed and glazed, and a clock. On a table is placed a filter, daily filled with fresh water, and a swivel knife for cutting tobacco. In the book press are several volumes of bound periodicals, the property of the recreation room. The newspapers taken in are as follows:—

Daily	-	Times, three copies.
,,		Telegraph, three copies.
Bi-weekly	-	Sporting Life.
Weekly	-	Illustrated News.
,,		Illustrated Times.
,,		Bell's Life.
,,		The Realm.
,,		Kentish Independent.
,,		United Service Gazette.
,,		Punch.
Monthly	-	The Wellington Gazette.
,,		Jackson's Woolwich Journal.
,,		Army List.
,,		Bradshaw's Railway Guide.
Periodicals	-	London Reader.
,,		Bow Bells.
,,		Home Magazine.
,,		The Christian World.
,,		London Journal.
,,		Family Herald.

One table in the reading room is reserved for writing letters, and furnished with green baize, inkstands, and blotting pads. Subscribers are supplied with letter paper and envelopes gratis if used in the room. About 6*s.* 3*d.* was expended for writing paper, &c. during the last quarter.

The room to the right on entering is used as a *recreation room.* It contains a small billiard table, 7 ft. by 3 ft. 6 in. (it is possible that a full-sized billiard table will be obtained shortly), three bagatelle boards and stands, backgammon, dominoes, chess and draught tables complete, and chairs and benches.

The serjeant's quarter and approach to it is fitted up as a bar, with shelves, and a stove with kettles for tea and coffee. The refreshments sold are bread, cheese, butter, biscuits, eggs, bacon, ham, and cold meat; tea, coffee, ginger beer, and lemonade. The tobacco is first bought at the canteen, and re-sold to the subscribers at their own bar.

The reading room only is open on Sundays, and during the week both rooms from 6 a.m. to 9.30 p.m. in summer, and from 6.30 a.m. to 9 p.m. in winter.

The rates of subscription are as follows:—

For an officer (library only)	-	1*s.* per month.
For a serjeant	-	6*d.* ,,
,, corporal ,, bombadier ,, artificer	-	4*d.* ,,
,, gunner ,, driver	-	3*d.* ,,

The effective strength of the Royal Horse Artillery depôt is 453, including the officers. The number of subscribers to the library and recreation rooms is 270, *so that three out of every five soldiers of the brigade are subscribers.* The rooms are very well attended, especially

App. XV. No. 4.

the recreation room, which is on most evenings quite full. In fact, greater accommodation will be required during the winter months. About 10*l.* to 12*l.* per month is spent by the subscribers for refreshments. The newspapers mostly read are the "Times" and "Daily Telegraph," the military and local papers, and the cheap periodicals. The "Realm" is to be discontinued; one of the subscribers described it as "very abstract." The old newspapers are sold.

Of the Cavalry Depôt Recreation Room.

This consists of a building standing by itself, and was formerly a hospital. It contains—

1. *A Reading Room*, furnished with tables and chairs, nine maps and plans of cities suspended on the walls, several volumes of various periodicals, bound, and one copy of each of the following newspapers:—

Daily -	Times.
,,	Standard.
,,	Telegraph.
,,	Star.
Bi-weekly -	Sporting Life.
Weekly -	Illustrated News.
,,	Illustrated Times.
,,	Scotsman.
,,	News of the World.
,,	Army and Navy Gazette.
,,	United Service Gazette.
,,	Punch.
,,	Canterbury Journal.
Periodicals -	Cassell's Family Paper.
,,	London Journal.
,,	Family Herald.
,,	All the Year Round.
,,	Bow Bells.
,,	Halfpenny Journal.

Adjoining the reading room, and leading out of it, is a smaller room for writing letters. It is furnished with a table covered with green baize, and has inkstands and blotting pads, &c. There is a clock in the room, and also a letter box. Subscribers to the club are supplied with letter paper and envelopes gratis if used in the room. The walls are covered with diagrams representing gas making, iron smelting, the steam engine, the nations of the world, &c.

2. *A Billiard Room.*—This contains a first-class, large sized, slate billiard table, made by Thurston, complete. On the walls are five engravings, framed and glazed. (It is purposed to have benches round the room.)

3. *A Recreation Room*, for games.—This contains a bagatelle board on stand, draught and chess *tables*, complete. Also dominoes, backgammon, and other games. On the walls are four engravings, framed and glazed.

4. *A Bar*, with librarian's quarter within it, having a private door for the use of his family. The refreshments sold consist of bread, cheese, butter, ham, bacon, eggs, cold meat, sherbet, ginger beer, lemonade, tea, coffee, and tobacco. The tobacco is supplied from the canteen.

The building is lit with gas, and supplied with sanitary conveniences on the basement floor.

The recreation room is open on Sundays, with the exception of the billiard room and room for games. It is open every day till 9 p.m. in the summer, and 8.30 p.m. in the winter.

The rate of subscription is as follows :—

For an officer (library only) -	- 1*s.* per month.
For a serjeant - -	- 4*d.* „
„ corporal - -	- 3*d.* „
„ trumpeter or private -	- 2*d.* „

The effective strength of the Cavalry depôt is 722, including the officers. The number of subscribers to the garrison library and recreation room is 463, *so that nearly two out of every three soldiers of the depôt are subscribers.* About 80 soldiers daily attend the rooms. This number will be very much increased during the winter months. The amount of money spent for refreshments over the counter averages at present about 1*l.* 8*s.* per week, but this is increasing. The subscribers would like to be able, if they wished for it, to have beer in their recreation rooms, and would be content (so they say) with a small quantity if it were really good. The newspapers mostly read are the Telegraph and Standard, the News of the World, Sporting Life, the Military Journals, and the cheap weekly periodicals.

The old newspapers are sold.

The recreation rooms of both depôts have now been opened for more than a year; no disturbance has ever taken place in them, and none of their property been stolen or wilfully damaged.

I have, &c.
(Signed) T. B. Maynard,
Chaplain to the Forces.

To Colonel Custance, C.B.,
Commanding the Troops at Canterbury.

Appendix XVI.

From His Excellency Lieut.-Gen. Sir W. R. Mansfield, K.C.B.

No. 1289.

Sir, Head-quarters, Poonah, 8th July 1864.

I have the honour to forward for submission to the Council of Military Education the annexed annual report on the Army Schools in this command.

I have, &c.,
(Signed) W. R. Mansfield,
Lieutenant-General commanding the Troops, Bombay.

The Secretary to the
Council of Military Education, London.

From the Acting Superintendent of Army Schools, Bombay Presidency.

No. 243.

Sir, Poonah, 25th June 1864.

I have the honour to forward the annual report on the Army Schools in this Presidency, for the information of the Council of Military Education.

2. During the cold season of 1863-4, I inspected regimental schools in the following stations :—Bombay, Kurrachee, Hydrabad, Baroda, Ahmedabad, Sholapore, Ahmednuggur, Mhow, Belgaum and Poona.

App. XVI.

Bombay Brigade.—Her Majesty's 103rd Regiment.

I inspected this school just before the regiment marched for Neemuch, where it now is. About 50 men were present; but owing to the heavy duty which devolves upon the men stationed at the Presidency, the attendance at school is very irregular. All, however, are *compelled* to attend until they have obtained a certificate of the lowest standard. Of the men present, all were able to sign their accounts but one or two, and some could read and write well. The men in the upper class were able to answer a few questions in grammar, and the elements of geography.

2. The grown children were divided into three classes, and the ages of those in the 1st class varied from 10 to 15 years. They read well, and answered fairly a few questions in English history, and the geography of Europe; knew very little grammar, but wrote well from dictation. Those in the 2nd class read well, but wrote badly from dictation. The children of the lowest class were learning to read; I found them rather backward in the Old Testament history. The whole of the children were examined in the early History of the World and the Life of Abraham, and showed by their answers that they had been well instructed in these points, but I was sorry to find the Protestant children very ignorant of many simple truths and facts of the New Testament with which they ought to have had an intimate acquaintance.

3. Most of them had been taught vocal music by Mr. Clarke, the schoolmaster, who is himself a very good musician, and I was pleased with the proficiency displayed in that very important, and to them very interesting, branch of study.

4. The services of 3rd class schoolmaster Clarke will, I regret to say, be soon lost to the department, he being about to take his discharge. I consider him an excellent teacher, and a most respectable man. The schoolmistress is untrained, and is not very proficient in the art of teaching. I believe, however, that she is a good needlewoman, and thoroughly competent to conduct the duties of the Industrial School.

Her Majesty's 28th Regiment.

5. When I inspected this school only a wing of the regiment had arrived from Nusseerabad, and therefore for the reason given in para 2, the attendance at school was very small. The instruction was for the most part of a very elementary nature. Two men, however, were in advance of the rest, and were very well up in algebra as far as quadratic equations, and were well acquainted with the formulæ given in the early part of Colenso's Algebra; their knowledge of mathematical geography, grammar, and parsing was *excellent*. These men's names were Charlesworth and Meldrum.

6. There were about 32 children in school. I examined the 1st and 2nd classes in Scripture history, mathematical and general geography, and reading, in all which subjects they had been well grounded. Some of the protestant children wrote out from memory their "duty towards "God," and others, their "duty towards their neighbour;" their *spelling* and writing were on the whole very good indeed. In this school, too, vocal music is taught by the schoolmaster, and the children sang some very pretty pieces from notes.

7. The industrial class was well attended, and ably superintended by the schoolmistress.

8. I have much pleasure in recording the good opinion I entertain of the ability of 3rd class schoolmaster Bell, an opinion shared by his commanding officer. I consider him well deserving of promotion to the 2nd class. App. XVI.

Scinde Division.—Her Majesty's 109th Regiment.

9. The attendance at this school was very large, there being nearly 500 on the school books, the majority of whom are recruits. There are a great many Germans in the regiment, a part of the old German legion having been amalgamated with the 3rd European regiment. The whole of the instruction was of a very elementary character, reading, writing, and arithmetic being the chief things taught. The attendance is compulsory. Kurrachee.

10. I examined the children in reading, geography, political and mathematical, grammar, and the New Testament, in all of which they exhibited fair proficiency. Singing is not taught. The work executed in the industrial school had been distributed, and there was, therefore, none to show. The schoolmaster seemed efficient.

Head Quarters, 18th Brigade, R.A.

11. There being only one battery of artillery at head-quarters, the attendance was necessarily small. The instruction, as in the generality of army schools, was of an elementary kind. The children had been very well instructed, and for the most part replied intelligently to the questions put.

12. The schoolmaster, Mr. Ford, had not been conducting himself well, and at the request of the officer commanding the brigade, I cautioned him that a continuance of misconduct would render him liable to reduction. He has since been reduced, however, to the rank of private by the sentence of a court-martial, and sent back to his regiment.

Kurrachee Depôt.

13. This school was closed for the greater part of the year, but re-opened the day before my inspection. There were no adults present, and only 12 children. They were divided into two classes, the ages of those in the first varying from nine to 14 years, and of the rest from seven to nine years; the last mentioned were learning to read and write. Those in the first class could read and spell fairly, and were able to answer a few simple questions on the geography of Europe, and two of them were remarkably well up in the New Testament truths; they had been taught them, they told me, in a Sunday school at Mooltan, from which station they had just arrived.

14. The school of a depôt must of necessity be very fluctuating, as families which come from up-country remain there so short a time. The schoolmaster serjeant in charge seemed an intelligent man.

Hydrabad.—A. Battery, 18th Brigade, Royal Artillery.

15. I was very much pleased with this school. The neatness and cleanliness of the men, and the good arrangements of the school, bespoke the care and attention bestowed by the commanding officer and schoolmaster. The officer commanding the battery takes great interest in the school, and has reason to be proud of the success which has attended his endeavours to promote efficiency and further the interests of the men.

App. XVI. Reading, arithmetic, writing in copybooks, and from dictation, are the principal subjects taught; but in the place of geography and grammar, which are for the most part unpopular amongst soldiers, they are instructed in subjects relating to the branch of the service to which they belong. The attendance of gunners is voluntary.

16. There is a library and reading room attached to the battery, for the support of which about 30 rupees are subscribed monthly by the men.

17. The school is in the charge of 4th class schoolmaster Farrell, a locally-trained schoolmaster; he has served in his present rank for about 3½ years, and I consider him deserving of promotion.

Her Majesty's 95th Regiment.

Hydrabad. 18. Only a wing of this regiment is stationed at Hydrabad, the other being at Aden. When I inspected the schools about 88 men were borne upon the books, 54 of whom were present. From want of accommodation the adult and young children's schools are held in different parts of the lines,—to the former a part of the barracks had been allotted,—whilst the latter was held in one of the patcherries.

The subjects taught were of the same kind as those already alluded to, and this remark would apply to most of the schools, for rarely have I seen anything but the first elements of education imparted in a regimental school, the only point of difference between the various schools being the degree of proficiency displayed therein.

19. I was informed that of the men attending school 28 had learned to read and write since enlisting.

20. The grown children's school was in very good order; they read well and wrote fairly from dictation. Upon being told to write out from memory anything they had learned, with a view to testing their spelling, &c., some wrote hymns, and others verses from Scripture. Their knowledge of the New Testament was for the most part very creditable, and showed that this very important part of their education had not been neglected. I was much pleased with their singing.

21. The very young children under the care of the schoolmistress, Mrs. Walker, were able to read a little. The work of the industrial class was exhibited.

22. 2nd class schoolmaster Walker was on a former occasion recommended for promotion by Captain Scrivener, and I consider him well deserving of advancement.

23. The Hindustanee class mustered during the month of December 1863 six men, but the average daily attendance was only three. A knowledge of Hindustani is not much sought after by soldiers as a rule, as it does not always bring with it substantial reward. It might reasonably be supposed that for the sake of their own convenience they would be induced to make use of the books and teacher provided for them, but such does not appear to be the case.

24. I believe, however, that the schoolmaster has passed the test laid down for officers seeking employment on the staff, and I presume received the usual allowance of 180 rupees granted to the successful candidates. As some other schoolmasters have likewise passed the examination, I shall append to this report a copy of the prospectus of the same.

Northern Division.—G. Battery, 18th Brigade, R.A.

Baroda 25. This battery had just returned from Dhooliakote, where it had gone for the annual artillery practice, consequently no adults were

present at my inspection. The names of 20 non-commissioned officers and men were borne upon the books.

26. The grown children present were five, infants four; I considered the former rather backward. They were divided into two classes; I examined the 1st class in reading, grammar, arithmetic, and geography, and also asked a few questions on general subjects. I did not consider them as well up as they ought to have been. Those in the 2nd class were very backward; they read badly, were unable to spell correctly, and knew very little arithmetic; only one of them knew where the sun rises and sets, and most of them thought the earth larger than the sun.

27. Acting schoolmaster Hambley took charge of the school in the month of November 1863; I consider him to be thoroughly competent for the duties he has to perform.

E. Battery, 14th Brigade, Royal Artillery and Headquarters 14th Brigade, Royal Artillery.

Ahmedabad.

28. All the adults were out at Vingool for their annual practice, and I was unable therefore to inspect their school. Eight children were present, only three of whom, however, belonged to the battery; indeed, I was informed that at the time of my inspection there were only five children with the battery in all. The attendance had been *most irregular*, and for many days all had been absent. The schoolmaster informed me that the commanding officer had taken notice of the irregularity of attendance, since which there had been an improvement. I found them very backward in reading and spelling, and their writing from dictation was not what it should have been; they were tolerably well up in the New Testament and the geography of Europe. Up to within a month of my arrival there had been a great scarcity of books and materials, but at that time the school was well supplied. The schoolroom is a sufficiently commodious apartment and adjoins the battery library.

29. The schoolmaster, Mr. Nutty, belongs to the Indian Educational Department, and appears to be equal to his position.

30. On account of the chaplain's continuous ill-health, the school had never been visited by him. The Sunday school had been conducted by the schoolmaster.

Her Majesty's 56th Regiment.

Deesa.

31. The average daily attendance of adults at this school during the year 1863 was 39, and of the children 13.

32. The commanding officer reported well of the schoolmaster and schoolmistress during the whole year.

Mhow Division.—Her Majesty's 72nd Highlanders.

Mhow

33. This school still retains the high reputation for efficiency which it so justly obtained in previous years. I was much pleased with what I saw at the time of the inspection.

34. The adult school is divided into three classes, viz., an advanced class, 3rd class, and 4th class, which is also sub-divided into three divisions. The aggregate number of men attending them was 167, of whom 112 were present.

35. The 1st class was represented by a non-commissioned officer and two privates; they were studying algebra, trigonometry (heights and distances), arithmetic, geography, &c. I saw some of their mathematical work, and questioned them in mathematical geography, &c. Their answers were very satisfactory. One of these men has learned to read and write since enlisting.

App. XVI.

36. The subjects studied in the 3rd class were writing general orders from dictation, arithmetic, reading, geography, grammar, &c. In this class 12 men had learned to read since enlisting. The subjects taught in the three divisions of the 4th class were of a similar nature, but grammar and geography were not taught to the two last divisions. In this class altogether 51 men had learned to read and write since enlisting.

37. The average strength of the regiment for six months was 897, of whom only 52 were unable to read and 73 unable to write.

38. I was informed that for the last 18 months the system had been in force of granting promotion regimentally to such men only as had obtained the school certificates: *e.g.*, before a private could be promoted to lance corporal, he was obliged to be in possession of a 4th class school certificate, &c., &c. This system had been found to act as an incentive to regular attendance at the school.

39. At that time the Hindustani class contained eight men. I was requested to examine three of them in the Bagh-o-Bahar (the text book used at the Hindustani examination for officers and civilians), and to award the prizes offered by the commanding officer. I was very much pleased with the knowledge of the language displayed by all three; but one of them in particular was remarkably well up. Nine men of the regiment have passed in the colloquial examination, and the schoolmaster has passed the staff test.

40. The children's school was in capital order, and they had evidently been instructed with great care and diligence. They had been taught vocal music on Hullah's system. The industrial class had been principally employed in making up and mending clothes brought from their own homes.

41. Several lectures were delivered to the men during the rains, a list of which is appended to this Report.

42. The library was a very good one, and contained then 1,086 vols.; it was supported by the subscriptions of 503 members, who paid two annas each monthly. Ten newspapers and eight periodicals were taken in; and there were various games for the amusement of the members.

43. I have much pleasure in bearing testimony to the admirable manner in which 2nd class schoolmaster Fowler conducts the duties of the school; he is a very able teacher, and is universally respected.

44. I can most strongly recommend him for promotion to the 1st class.

Head Quarters, 21st Brigade, Royal Artillery.

Khow.

45. When I inspected this school it was labouring under the great disadvantage of being without a schoolroom; the work was therefore carried on in two small rooms in a patcherie in the lines of the 72nd Highlanders. The artillery barracks were under construction. The inspector-general of artillery was then engaged in inspecting the brigade, and the adult school was therefore closed.

46. The children of the 1st class were examined in reading, writing from dictation, grammar, and geography of the world, of all of which they possessed a good knowledge; they were not so good at parsing; they knew the New Testament fairly. In the 2nd class some read well, others not so well; all did arithmetic (simple rules) fairly, but were all bad at spelling.

47. The children in the infant school were learning to read. I asked them a few very simple questions on New Testament truths, but was surprised at their gross ignorance. The schoolmistress had not been in the habit of giving religious instruction, nor had the chaplain (Rev. Mr.

Hamilton, of the Bengal Establishment) visited the school for that purpose. App. XVI.

48. Some of the children of this brigade were attending the school of the 6th Dragoons, it being more convenient for them, on account of its greater proximity to their own lines.

49. Schoolmaster Birkbeck is an intelligent young man, and I believe has always given entire satisfaction. The commanding officer reported well of the untrained schoolmistress, Mrs. Pennington.

Her Majesty's 6th Dragoons.

50. So many men were at home on court-martial duty that the attendance at school was very small, and only 53 names were on the books. At any time the numbers attending the school of a cavalry regiment are less than those who go to that of an infantry corps. The highest class was the 3rd, represented at the time of my inspection by four (4) men. They could read and parse well, and one of them was well acquainted with English grammar. In arithmetic two of them could work fractions, and the rest were doing simple proportion. The men in the two sections of the 4th class were less advanced than those just referred to. Mbow.

51. One or two men were learning Hindustani, but the moonshee did not appear to me to be a competent teacher; those who are so are very rare.

52. The school accommodation was bad, the cavalry lines, like those of the artillery, being under construction. The room at present used was formerly the quarters of a troop serjeant-major.

53. The children's school was, on the whole, in an efficient state, though here too the attendance was very limited. The 1st class was represented by four children, who were examined in reading, parsing, and geography. In the first and last of these they acquitted themselves very well indeed, but the parsing of three of them was *very bad*. Their writing in copy books was creditable.

54. The 2nd class passed a good examination in reading, compound rules of arithmetic, geography, and grammar; and those in the 3rd class, although unable to read well, could spell correctly, knew the multiplication tables accurately, and were able to work sums in the first four rules of arithmetic.

Her Majesty's 106th Regiment.

55. From the reports received monthly this school appears to have been in an efficient state during 1863. Ncemuch.

56. The average daily attendance of the adults was 27, and the number of children on the books was 35.

57. Schoolmaster and Schoolmistress Wolfe, both superior teachers, and very highly reported of, were transferred in July last to the Aboo Lawrence school, and were succeeded in the month of September by 2nd class schoolmaster, and acting schoolmistress, Eaglesome. Schoolmaster Eaglesome is also a very good man, and received very high eulogiums from his former commanding officer.

58. After the departure of the first schoolmaster, until the arrival of the second, a schoolmaster serjeant conducted the school duties.

D. Battery, 18th Brigade, Royal Artillery.

59. The attendance at this school during the year was very poor, owing to the heavy work which fell to the men; one month none Ncemuch.

App. XVI. attended at all. The average attendance for the year was 11, and the number of children on the school books was 8.

60. The 4th class schoolmaster in charge was reported to perform his duties satisfactorily.

A. Battery, 4th Brigade, Royal Horse Artillery.

Nusseerabad. 61. For the few months of the year a bombardier of the troop was in charge of the school, but the want of a trained schoolmaster having been much felt, a 4th class schoolmaster was supplied in the month of August, under whom a change for the better was effected.

62. The total number of adults and children on the school books was 79.

C. Battery, 4th Brigade, Royal Horse Artillery.

63. During the month of January 1863 the troop was at Nusseerabad, and the average attendance of adults was only five, and of children seven. The following month, the troop being on the march to Mhow, the school was closed.

64. On arriving at its destination the schoolmaster was sent to the B. Battery, 18th Brigade, at Sholapore, where his services were needed, and the men attended the school of the 21st brigade.

65. Whilst with the troop the schoolmaster was reported to be efficient.

Her Majesty's 44th Regiment.

Belgaum. 66. The number of adults borne upon the books of this school was always large, but seldom more than one-third attended. At the time of my inspection there were 84 non-commissioned officers and men present.

67. I examined most of the classes in reading, writing from dictation, geography and grammar, and put a few questions to the assistants on the use of the theodolite, &c. A few elementary plans of surveys had been executed by them. Surveying had been taught by 1st class schoolmaster Brett, who for the first two months of the year was attached to the school cotemporaneously with schoolmaster Macartney.

68. During the past year 21 men of the regiment had learned to read and write.

69. The girls' school, under 3rd class schoolmistress Power, was in very good order, and the intelligence exhibited by the pupils was very satisfactory. I was much pleased with the schoolmistress's assistant.

70. The officer commanding the corps entertains a very high opinion of Mrs. Power's capabilities as a teacher, and she was, subsequently to my visit, recommended for promotion. I consider her to be fully deserving of the promotion sought.

71. A large quantity of work done in the industrial school was presented for my inspection.

72. In accordance with a circular recently issued the boys' classes were separated from those of the girls. I examined the 1st class of boys in mathematical and political geography, parsing, and a little algebra. Some of them exhibited an unusual degree of proficiency, and the first two, Holmes and Power, had drawn some large maps in a manner which did them very great credit.

73. The 2nd class was composed mostly of young boys; those in the 3rd class were not very intelligent. They were examined in reading, Scripture history, and arithmetic.

74. I have much satisfaction in reporting on 3rd class schoolmaster Macartney. He seemed a very intelligent and zealous young man, and thoroughly competent to fill his present position. App. XVI.

3/21. Royal Artillery.

75. The school of this battery was very small, and the instruction given was of a most elementary nature. The subjects taught were very imperfectly known. They read and cyphered badly, but wrote pretty well from dictation. Geography had not been taught.

76. Six children came forward for examination, three of whom could read tolerably well; their answers to questions in New Testament history were indifferent.

77. I saw very little of the schoolmaster, but from what I saw I deemed him to be deficient in intelligence.

E. Battery, 18th Brigade, Royal Artillery.

78. The attendance at this school averaged 29. The men were able to read and write a little, and some few could work a sum in simple proportion.

79. Some of the children were well acquainted with the geography of Europe, but were very backward in Scripture truths and history.

80. The school was at the time of my inspection in the charge of 3rd class schoolmaster Collins, but he has since been transferred to the head-quarters of the 18th Brigade, Royal Artillery, in the room of schoolmaster Ford reduced. Consequent on the issue of a General Order (vide Appendix C.) prohibiting the employment of a trained schoolmaster with a garrison battery (which the 3/21 Royal Artillery is), the school of the 3/21 Royal Artillery was amalgamated with that of the E. Battery, 18th Brigade, Royal Artillery, a field battery.

Poona Division.—B. Battery, 18th Brigade, R.A.

81. The adults of this battery had left the station for their annual practice; I therefore saw the children's school only. Shalapore.

82. The average daily attendance of the men was 15, which is four less than the average of the aggregate of all the artillery schools in the Presidency.

83. The children's school contained 14 children, who were formed into two classes. The elder boys and girls passed a creditable examination; the rest were moderately efficient. The ages of the children in the two classes varied respectively from 10 to 15 years, and from 6 to 10 years.

Her Majesty's 3rd Dragoon Guards.

84. This school was for some time burdened with a disreputable schoolmaster, who, however, was removed from the regiment in the month of July. The school for a part of the remainder of the year was in the charge of a non-commissioned officer, and subsequently of a private of the regiment, who at the time of my inspection appeared competent for the situation. Ahmednugur.

85. In the month of August, Mrs. Buckley, who for some time previously had had charge of the infant school, was appointed a provisional 3rd class schoolmistress.

86. The instruction was of a very elementary nature. I examined the men in reading and writing, and the 1st class in writing from dictation also, which was not satisfactory. The children of the 1st class had a fair knowledge of geography, and could read and spell. The 1st and 2nd classes were very backward in scripture history.

App. XVI.

D. Battery, 4th Brigade, Royal Horse Artillery.

Ahmednuggur.

87. The troop was at Kirkee for artillery practice, and I did not, therefore, inspect the school.

88. Judging from the monthly reports, I fear the progress made was far from satisfactory; this was partly caused by the want of proper school accommodation, and partly by the misconduct of the schoolmaster, who has since been dismissed from the department.

Royal Artillery.

Kirkee.

89. At the time of my inspection the force at Kirkee consisted of the head-quarters of the 4th Horse Brigade, the B. battery, 4th brigade, Royal Horse Artillery, Nos. 4 and 6 batteries of the 21st Brigade, the D. battery of the 14th Brigade, and the F. battery of the 18th Brigade.

90. Only 35 men, however, were present at the inspection, the duty being too severe to admit of their attendance.

91. I examined them in reading, the first elements of arithmetic, and in writing from dictation; the last mentioned was *bad*. The men's attendance being so very irregular it is impossible that much progress should be made.

92. I visited the evening school, which assembled from a quarter to 7 to 8 p.m. I found a much larger number of men present; some of them were working examples in quadratic equations, the rest in arithmetic.

93. The Hindustani class was then at work, and numbered six men. They could read simple stories in the Persian character, but were totally ignorant of the grammar of the language. A soldier appears to look upon the labour he would have to expend in acquiring a knowledge of grammar as unnecessary drudgery, and being therefore ignorant of it he, as a natural consequence, speaks *most inaccurately*.

94. The boys were fairly up in the various subjects taught. *All* the girls were under the schoolmistress, in accordance with Adjutant General's Circular, No. $\frac{99}{E}$, of the 16th September, 1863, a copy of which is appended to this Report (Appendix D.).

95. It appeared to me, however, that the schoolmistress was not equal to this heavy charge, and was rather overburdened. The girls too seemed to have suffered by the transfer, for though they could read and spell fairly many of them were unable to name the capital towns of the countries in Europe, and were very ignorant of the simplest truths connected with the life of Christ. I have reported this to the officer commanding artillery at Kirkee, but he seems to think the backwardness of the children is owing rather to their irregular attendance; he will, however, endeavour to effect an improvement.

96. 3rd class schoolmaster Gainher, and acting schoolmaster Lee, appeared to be efficient, and equal to their work.

1st Battalion, 4th (King's Own) Regiment.

Poona.

97. The school of this corps was in a flourishing state as regards numbers, a great many being compelled to attend until they had reached a certain standard; and I was pleased with the general appearance and tone of the school, which is ably managed by schoolmaster MacMahon, and his wife, the schoolmistress. They are both well qualified for their respective duties, and evidently take an interest in them, and perform them conscientiously.

98. The 4th, or lowest class, was composed of men who were learning to read and write, and whose attendance was compulsory. Those in the 3rd class were slightly in advance of the former, and could read and write a little, and work easy sums in the four first rules of aritmetic. None of them being fit for the 3rd class certificate, their attendance also was enforced. The men in the 2nd class read fairly, and wrote a little from dictation. They leave the school, or rather they cease to be compelled to attend, after passing through this class. The men of the 1st class attended of their own free will. They could read well, work vulgar fractions, and proportion, knew a very little geography, and for the most part wrote well from dictation.

99. It will be seen from the preceding paragraph that the instruction was of a very elementary character; but much cannot be expected of men who only learn the subjects required for the lowest certificate, and who look forward, not to the improvement of their minds, but to the time when they will be released from school.

100. The children had been well instructed in the usual subjects, and were fairly up. The whole of the Protestants were examined in part of the Old Testament and of the Gospel of St. Luke, and for the most part answered very well. The boys of the 1st and 2nd classes were examined collectively in English history, and by their replies to questions showed that great pains had been taken in instructing them.

101. I examined the work of the industrial school, and considered it satisfactory.

Her Majesty's 33rd Regiment.

102. What has been already said of adult schools would apply equally well to this. The 4th class, learning to read; 3rd class, read moderately, arithmetic as far as compound multiplication; 2nd class, read well, wrote well from dictation, worked sums in proportion; 1st class, reading good, arithmetic as far as vulgar fractions, geography slight knowledge, writing from dictation fair.

103. The boys in the first two classes did well, especially those in the 1st class who had a very good knowledge of English history, geography, and grammar.

104. The children sang together very nicely from notes, and seemed to enjoy it.

105. At the time of my inspection comparatively few were present, many being kept at home by measles, or on account of some member of the family being affected therewith.

106. I have much pleasure in reporting on schoolmaster and schoolmistress Carrol, and consider them both efficient and qualified for their respective duties.

Sappers and Miners.

Poona.

107. This school is a very important one, inasmuch as all the non-commissioned officers in the Public Works Department receive the necessary education here previous to joining the Department; it is, therefore, very essential that they should receive an education in many respects superior to that of men with a regiment of the line.

108. The schoolmaster, Mr. Kiely (a locally trained teacher), is admirably suited for his work, having a thorough knowledge of theoretical engineering and of mathematics generally. A 3rd class schoolmaster has recently been attached to the school to aid Mr. Kiely.

App. XVI.

109. The subjects of instruction are:—Reading, writing from dictation, arithmetic, mensuration, geometry, estimating, surveying, levelling, drawing, the making and preparation of materials used in building, and Hindustani. Those who show an aptitude for instruction are also taught plane trigonometry, and a little engineering.

110. I examined them in writing from dictation, which they did fairly, in the use and adjustment of the theodolite and levels, and in Hindustani. I saw also several of their plans of surveys and levelling.

Detachment of Royal Artillery.

Aden.

111. The want of a schoolmaster having been much felt, a non-commissioned officer of the 33rd Foot, who was then at the training school under my charge, was sent to Aden as acting schoolmaster to establish a school.

112. The school was opened in November 1863, and the following month the officer commanding the detachment of artillery at that station reported as follows:—"I consider the schoolmaster and his assistant as well qualified for their duties in every way."

113. In addition to the regimental schools, the central military school was in operation as in past years. Soldiers of good character, and who are able to read and write well and work the first four rules of arithmetic, are sent to it for instruction. At the termination of the annual course, some men usually obtain subordinate appointments in the military offices, whilst any who may be qualified are retained for further training as schoolmasters. From this source the schoolmasters have always been supplied to the local European regiments and brigades and batteries of artillery.

114. First class schoolmaster Clifford is the master of this institution, and performs his work with ability and diligence, He, too, has passed the examination described in Appendix A.

115. I should mention that all the students at the central military school are instructed daily in Hindustani, and last year 12 out of 28 of them passed the colloquial examination, as laid down in the code of regulations. A copy of the prospectus is appended hereunto (Appendix K.) The moonshee is the best I have ever seen for collective teaching.

116. In connexion with this, and also under my superintendence, is a normal school for training sepoys as schoolmasters of the native regiments. A large number of men have been trained here, and 30 are now students at the school.

117. It will be seen from the foregoing report how very elementary the instruction given in army schools, for the most part is:—yet if all the men are taught even *to read and write well*, the labour expended on the department will not have been in vain. Much more than this will not, I think, be attained.

I have, &c.

The Secretary to the
Council of Military Education, London.

G. A. Jacob, Lieut.,
22nd Regt., N.I.,
Acting Superintendent of Army Schools.

A.

G. O. G. No. 532 of 1860. With reference to G. G. O. No. 487, dated 19th July 1850, and to the Government notification, dated 25th October 1858, the Governor in Council is pleased to publish the following rules, prepared by the examination committee, for the examination in Hindoostanee of military officers who may be desirous of qualifying themselves for staff employment, excepting appointments in the commissariat department, the office of cantonment joint magistrate, and interpreterships to regiments, for these the interpreter's examination is required.

(Signed) W. F. Marriott, Captain,
Acting Secretary to Government.

Points for Examination.

Written translation of an English passage in an easy narrative style into Hindoostanee, both in the Persi, Arabic, and Nagree character. Maximum number of marks, 75.

2. Vivâ voce and extemporaneous translation into English of a passage from the "Bagh-o-Bahar," in the Persi Arabic character. Maximum number of marks, 60, of the exercise.

3. Vivâ voce and extemporaneous translation into English from the "Betal Pucheesee," in the Nagri character. Maximum number of marks, 60.

4. Conversation in Hindoostanee with native gentlemen, as well as with officers and non-commissioned officers of native corps. Maximum number of marks,

5. Pronunciation, as tested throughout the examination. Maximum number of marks, 50.

6. Handwriting, as tested in the first exercise. Maximum number of marks, 25.

Errors shall be divided into three classes, viz., errors in meaning, errors in syntax, and errors in spelling.

In each class two kinds shall be distinguished, major and minor, one of the former being reckoned equal to two of the latter.

A major error in meaning shall be counted as five units of value; a major error in grammar as three, and a major error in spelling as two.

The errors of each translation shall be distinctly marked on the face of it.

The sum of errors, reckoned as above directed, shall be deducted from the full value, and the remainder assigned as the value of the exercise.

A candidate will not be entitled to a certificate of having passed the examination, if he shall have obtained less than 60 per cent. of the aggregate value of full marks, or shall have obtained, in respect of any particular exercise, less than 20 per cent. of the marks assigned to it.

Every examinee, whether successful or unsuccessful, shall be allowed to see the general result of the judgment formed respecting him, and the grounds of that judgment so far as they appear on his own exercises.

App. XVI. B.

B.

Soldiers' Institute, 72nd Highlanders.

Third Course of Lectures and Readings, 1863.

No.	Date.	Subject.	Lecture or Reading.	By Whom.
1	July 6th -	Polar Seas - -	Lecture -	Lt. H. Vanheythuysen, 9th Regt. B.N.I.
2	„ 13th -	Ancient and Modern Fire Arms.	Lecture -	Schoolmaster C. B. Fowler, 72nd Highlanders.
3	„ 20th -	"Prince Charlie"	Lecture (illustrated by Jacobite Songs.)	Rev. John Paton, 72nd Highlanders.
4	„ 27th -	The Sea - - -	Lecture -	Rev. C. W. Taunton, Indore.
5	August 3rd	Sketch of the History of the Highland Regiments. Lecture I.	Lecture -	Rev. John Paton, 72nd Highlanders.
6	„ 10th	The French Revolution.	Lecture -	Dr. F. G. Joynt, 9th Regiment B.N.I.
7	„ 17th	"Rab and his Friends." (Brown.)	Reading -	Rev. John Paton, 72nd Highlanders.
8	„ 24th	Sailors and their Songs.	Lecture (with musical illustrations.)	Dr. H. C. Brodrick, Indore.
9	„ 31st	The Australian Gold Fields.	Lecture -	C. W. Hutchinson, Indore.
10	Sept. 7th -	Sketch of the History of the Highland Regiments. Lecture II.	Lecture -	Rev. John Paton, 72nd Highlanders.

N.B.—The lectures and Readings will be delivered in the Lecture Room of the Infantry Barracks, and will commence each evening at 6.30.

C.

G. G.O. No. 514 of 1863.

Bombay Castle, 13th October 1863.

Para. 3. A garrison battery will not be allowed a schoolmaster when located at the same station as a horse or field battery or European regiment, and it is practicable for the men to attend such battery or regimental school.

D.

Circular to Officers Commanding British Regiments, Brigades and Batteries of Royal Artillery, and Convalescent Depôts, also to the Adjutants General, Madras and Bombay.

No. 99.

E

Adjutant General's Office, Head Quarters, Simla,
Schools. 16th September 1863.

His Excellency the Commander in Chief is pleased to announce that His Royal Highness the Field Marshal Commanding in Chief has decided that the rules laid down in the Indian Army Regulations, Section LVII. (Schools) paras. 36, 37, and 38, in regard to the instruction of boys and girls, shall, as a general principle, be observed in army schools in India, viz.

The female school for the instruction of the daughters of non-commissioned officers and soldiers to be under the charge of the schoolmistress.

The younger boys also to receive instruction in the female school until they shall be able to read words of two syllables at least, or attain the age of 6 to 8 years.

The female school to be conducted in a room quite apart from the ordinary school-room.

2. But in cases where there is a trained schoolmaster but not a trained schoolmistress, the commanding officer is permitted to authorize a departure from these rules and to allow the instruction of the elder boys and girls together by the schoolmaster as in England ; also, whenever in his opinion, or on the report of the inspector of schools at his visits, the acting schoolmistress is not competent to afford instruction in all the required branches to the elder girls.

3. Any deviation from the above rules must however be noted in the monthly school reports, and the reason for the course adopted assigned in the first report furnished after the alteration is made.

By Order,

E. Haythorne, Colonel,
Adjutant General.

E.

Average Attendance at Army Schools during the Year , Poona.

Regiment.	Station.	No of Months taken.	On School Books. Average Daily Attendance. Non-commissioned Officers.	Privates.	Total.	Average No. of Hours Instruction weekly for Privates.	On School Books. Boys.	Girls.	Total.	Industrial School.	Total Number of Adults and Children attending.
Central Military School	Poona	9	—	—	—	4·90	17·30	22·20	—	—	—	—	22·20
H.M.'s 3rd Dragoons	Ahmednuggur	12	43·58	55·58	99·16	12·33	27·26	39·59	3·56	22·41	14·41	36·82	16·58	135·98
H.M.'s 6th Inniskillings	Mhow	12	9·58	55·33	64·91	3·44	17·07	20·51	1·72	24·08	10·83	34·91	20·82	99·82
Head-quarters 4th & 18th, bds. R.A.	Kirkee	12	57·08	87·50	144·58	9·61	23·45	33·06	3·83	42·25	45·00	87·25	60·31	231·83
Head-quarters 14th brig. R.A.	Ahmedabad	3	37·00	36·66	73·66	11·99	5·00	16·99	11·40	7·33	6·00	13·33	4·00	86·99
Head-quarters 18th "	Kurrachee	11	2·72	19·00	21·72	—	—	13·26	4·31	16·09	17·47	33·56	20·81	55·28
Head-quarters 21st "	Mhow	10	22·40	14·10	36·50	7·43	5·29	12·72	3·00	14·70	19·70	34·40	—	70·90
A/4 Royal Horse Artillery	Nusseerabad	9	13·11	57·11	70·22	7·22	20·66	27·88	7·15	3·63	5·22	8·85	—	79·07
C/4 " " "	Mhow	2	15·00	30·00	45·00	6·47	15·15	21·62	8·65	5·00	2·50	7·50	—	52·50
D/4 " " "	Ahmednuggur	10	8·50	32·00	40·50	4·00	9·70	13·70	14·40	10·40	5·90	16·30	3·20	56·80
A/18 Royal Artillery	Hydrabad	12	21·33	53·16	74·49	12·00	26·70	38·70	5·10	7·75	8·50	16·25	8·74	90·74
B/18 " "	Sholapore	8	19·87	4·00	23·87	13·03	2·85	15·88	2·64	7·30	10·20	17·50	8·70	41·37
D/18 " "	Neemuch	12	1·66	29·00	30·66	·53	11·24	11·77	3·14	4·66	4·00	8·66	—	39·32
E/18 " "	Belgaum	8	25·24	36·37	61·61	14·75	14·88	29·63	7·97	7·63	2·12	9·75	—	71·36
G/18 " "	Baroda	12	8·58	8·25	16·83	2·85	2·02	4·87	1·39	10·91	3·58	14·49	2·25	31·32
3/21 " "	Belgaum	12	12·24	11·16	23·40	8·12	6·71	14·83	8·08	3·08	2·58	5·66	—	29·06
Detachment Royal Artillery	Aden	2	15·50	22·00	37·50	7·37	7·93	15·30	3·62	6·00	5·50	11·50	—	49·00
Bombay Sappers and Miners	Poona	12	27·99	—	27·99	7·03	—	7·03	19·77	—	—	—	—	27·99
1/4 King's Own regiment	Poona	12	25·50	250·00	275·50	3·28	74·83	78·11	1·84	32·33	25·50	57·83	41·66	333·33
H.M.'s 28th regiment	Nusseerabad	10	5·50	94·20	99·70	0·46	31·66	32·12	3·49	27·70	25·80	53·50	25·80	153·20
H.M.'s 33rd "	Poona	12	45·91	78·25	124·16	10·19	27·24	37·43	3·12	36·58	34·58	71·16	48·58	195·32
H.M.'s 44th "	Belgaum	12	51·41	185·50	236·91	9·84	54·12	63·96	4·55	46·83	45·08	91·91	58·58	328·82
H.M.'s 56th "	Deesa	12	33·24	104·66	137·90	6·00	33·83	39·83	5·41	5·83	8·00	13·83	13·58	151·73
H.M.'s 72nd "	Mhow	12	56·91	139·58	196·49	28·16	60·26	88·42	4·46	15·83	10·00	25·83	14·33	222·32
H.M.'s 95th "	Hydrabad and Aden	11	50·54	125·54	176·08	5·59	36·26	41·85	3·44	24·27	24·36	48·63	36·27	224·71
H.M.'s 103rd "	Bombay	10	20·80	177·00	197·80	5·50	64·34	69·84	4·39	28·70	36·60	65·30	36·00	263·10
H.M.'s 106th "	Neemuch	12	28·50	48·58	77·08	6·13	21·25	27·38	4·71	21·58	13·65	35·23	11·33	112·31
H.M.'s 109th "	Kurrachee	12	44·66	133·08	177·74	7·88	46·93	54·81	2·90	20·75	15·16	35·91	13·60	213·65
Kurrachee Depôt	Kurrachee	5	—	—	—	—	—	—	—	7·80	7·20	15·00	—	15·00
		—	704·35	1887·61	2591·96	216·10	665·93	893·29	—	461·42	409·44	870·86	—	3462·82

G. A. Jacob, Lieutenant,
Acting Superintendent of Army Schools.

F.

LIST of INDIAN TRAINED SCHOOLMASTERS doing duty in the BOMBAY PRESIDENCY.—POONA.

No.	Class.	Name.	Attached to.
1	1st Class - -	John Kiely - - -	Sappers and Miners.
,,	,, - -	Alfred Wolfe - -	Aboo Lawrence School.
3	,, - P.H.	William W. Clifford -	Central Military School.
1	2nd Class - -	George Eaglesome -	H.M's. 106th Regiment.
1	3rd Class - -	Robert Campbell - -	H.M's. 109th Regiment.
,,	,, - -	Robert Nutby - -	14th Brigade, R.A.
,,	,, - -	James Gainher - -	4th Brigade, R.A.
,,	,, - -	Andrew Collins - -	18th Brigade, R.A.
5	,, - -	Harrop Birkbeck -	21st Brigade, R.A.
1	4th Class - -	Timothy Downey -	D/18 Royal Artillery.
,,	,, - -	George Stewart - -	A/4 Royal H. Artillery.
,,	,, - -	Henry Bale - -	E/18 Royal Artillery.
,,	,, - -	Robert C. Farrell - -	A/18 Royal Artillery.
5	,, - -	Lawrence Clancey -	B/18 Royal Artillery.
1	Acting School masters.	Charles Harte - -	Royal Artillery, Aden.
2	,, - -	Thomas Lee - -	D/4 Royal H. Artillery.

P.H. Passed Hindustani-staff test.

G. A. JACOB, Lieutenant,
Acting Superintendent Army Schools,
Bombay Presidency.

G.

G.

LIST of CHELSEA TRAINED ARMY SCHOOLMASTERS doing duty in the BOMBAY PRESIDENCY.—POONA.

No.	Clsss.	Name.	Attached to.
1	2nd Class - -	Thomas Walker (P.H.)	H.M's. 95th Regiment.
,,	,, - -	Charles B. Fowler (P.H.)	H.M's. 72nd Highlanders.
3	,, - -	Charles Carroll - -	H.M's. 33rd Regiment.
1	3rd Class - -	Robert Bell - - -	H.M's. 28th Regiment.
,,	,, - -	Frederick Duffield -	H.M's. 56th Regiment.
,,	,, - -	Thomas McMahon -	1/4 "King's Own" Regt.
,,	,, - -	Horatio Robinson -	H.M.'s 6th Inniskillings.
5	,, - -	James A. Clarke - -	H.M.'s 103rd Regiment.
6	,, - -	George W. Macartney -	H.M.'s 44th Regiment.

P.H. Passed Hindustani-staff test.

G. A. JACOB, Lieutenant,
Acting Superintendent Army Schools,
Bombay Presidency.

App. XVI. H.

H.

List of Schoolmistresses doing duty in the Bombay Presidency.—Poona.

N	Class.	Name.	Attached to.
1	Provl. 3rd Class	E. Buckley	H.M.'s 3rd Dragoons.
„	3rd Class	Margaret Jennings	H.M.'s 6th Inniskillings.
„	2nd Class	Eleanor Collins	4th Brigade, R.H.A.
„	Untrained	Jane Longmore	14th Brigade, R.A.
5	„	C. Macmahon	18th Brigade, R.A.
„	„	Elizabeth Pennington	21st Brigade, R.A.
„	„	Mary J. Stewart	A/4 R.H.A.
„	„	Sophia Blackhall	D/4 R.H.A
„	„	Caroline Murray	A/18 R.A.
10	„	Maria Neill	B/18 R.A.
„	„	Sophia Woolley	G/18 R.A.
12	3rd Class	Matilda Macmahon	1/4 K. O. Regiment.
„	Provl. 3rd Class	Mary A. Buchanan	H.M.'s 28th Regiment.
„	2nd Class	Caroline Carroll	H.M.'s 33rd Regiment.
15	3rd Class	Sophia Power	H.M.'s 54th Regiment.
„	2nd Class	Mary A. Duffield	H.M.'s 56th Regiment.
„	3rd Class	Frances Fowler	H.M.'s 72nd Regiment.
„	2nd Class	Eliza L. Walker	H.M.'s 95th Regiment.
„	Untrained	Mary A. Higgs	H.M.'s 103rd Regiment.
20	„	Agnes Eaglesome	H.M.'s 106th Regiment.
„	3rd Class	Caroline Duffy	H.M.'s 109th Regiment.
22	Not classified*	A. L. W. Wolfe	LawrenceSchool,Mt.Aboo.

* Having been appointed under the old regulations, and drawing Rs. 40 per mensem.

G. A. Jacob, Lieutenant.

K.

K.

His Excellency considers it desirable to publish a general outline of the examinations which will be considered to qualify officers for the command of troops or companies, or for a medical charge.

136. The committee being assembled will prepare two papers, each containing 15 or 16 sentences, one as a test for the subalterns, and the other for the assistant surgeons. The former will consist of subjects likely to occur in the various forms of military duty, including that of discipline, the instruction, pay, dress, &c. of a troop or company; the latter for assistant surgeons will embrace all points likely to occur in their particular intercourse with the natives; and for this purpose his Excellency has considered it desirable to appoint a medical officer as a member of the committee.

137. The several questions being prepared a candidate will be called in, and, whilst one of the committee reads slowly to him the sentences in succession, another member will take down the translation as he gives it.

138. The candidate will be expected to translate these fluently, with correctness of idiom, and tolerable accuracy of grammar.

Appendix XVII.

No. 854.

GENERAL ORDER.

Horse Guards, S.W.,
18*th October*, 1864.

Schools.
5—(1864).

His Royal Highness the Field Marshal Commanding-in-Chief, and the Secretary of State for War, having approved of an amended system of classification, inspection, and examination of army schools, His Royal Highness, with a view to carrying out the same, commands the following directions to be published for general information and guidance.

The practice which has hitherto prevailed in Army Schools of classifying the adults and grown children according to their attainments in one subject only, is henceforth to be discontinued, and they are in future to be arranged in Reading Classes according to their attainments in reading, and in Arithmetic Classes according to their attainments in arithmetic.

The Reading Classes of the adults will likewise take up writing (which requires no special classification for the purpose of instruction) as well as grammar, history, and geography.

Writing may also be taken up by the Arithmetic Classes; in this case it might be necesssry that the scholars should write upon single sheets of paper, such sheets properly ruled for text-hand writing will be supplied on requisition.

Unless the duration of the school attendance exceed one hour and a half, reading and arithmetic are not to be taught in adult schools at the same attendance.

Whenever the instruction in either reading or arithmetic is unequally affected by field-days or other causes preventing the attendance of the men, the balance can be restored by changing the daily routine, under sanction of the commanding officer.

Upon the name of an adult or of a grown child being entered on the school books, an examination book is to be set apart for him.

The highest degree of education to which the pupil has attained is to be shown by his writing exercises on the first page of this book. Directions for the examination will be found attached to the book.

This book is to be kept by the schoolmaster, who will issue it to the pupil on occasions of examination only.

The schoolmaster is to examine once every half-year, viz., during the four weeks preceding the summer and winter holidays, every pupil of the adults, and grown children's school whose name is on the school books. He is also to examine, at the time of withdrawal, every pupil who may leave the school during intermediate periods. The examination books are to be used on all these occasions.

The schoolmaster will enter in Form D. the result of the examination, and will forward that form to the Council of Military Education through his commanding officer, and will supply a copy of it to the assistant or local inspector of the district or station.

An examination similar to the half-yearly one will be held by the schoolmaster during the month preceding the visit of the assistant

App. XVII.

inspector or superintending schoolmaster; unless this visit should occur within two months of the schoolmaster's last half-yearly examination. The commanding officer will arrange that every adult whose name is on the school books shall give one attendance at least during the month, for the purpose of examination.

With the view of affording the assistant inspectors or superintending schoolmasters the best opportunity of judging of the progress and qualifications of all men attending regimental schools, and of reporting upon the same, His Royal Highness directs that, on the day or days which may have been previously fixed upon for the examination, all men whose names are on the school books, and who are not on guard or otherwise employed on urgent duties, be ordered to attend; and that in no case shall fatigue duties or ordinary parades be allowed to interfere with such attendance.

On the day of examination a return of men on the school books, who are sick, on duty, or otherwise employed and unavoidably absent, will be given to the examiner to enable him to refer to the work done by them at the schoolmaster's previous examination.

His Royal Highness having been pleased to approve of 1st, 2nd, and 3rd class certificates of education being issued by commanding officers upon the recommendation of assistant or local inspectors of army schools, commanding officers will arrange that all candidates for those certificates, whether belonging to the school or otherwise, shall attend for examination on the day appointed.

At those foreign stations which are not visited by assistant or local Inspectors of schools, but to which a superintending schoolmaster is attached, the recommendation of the latter officer may be accepted in lieu of that of the assistant or local Inspector.

Superintending schoolmasters may also, when required by the officer commanding the station, conduct the examination of candidates for certificates, even at stations visited by assistant or local Inspectors. But in this case the questions will be set by, and the written answers will be forwarded to, the assistant or local Inspector, with the errors noted thereupon by the superintending schoolmaster, and those who assist him; and the recommendation for certificates will be made by the assistant or local inspector to the commanding officer.

At stations which are not visited by an assistant or local Inspector, and to which there is no superintending schoolmaster attached, the examination of candidates for certificates of education will be conducted by a regimental board of officers, appointed by the officer commanding, with the assistance, so far as may be requisite, of the regimental schoolmaster.

The recommendations of such board may be accepted by the commanding officer in lieu of those of the assistant or local Inspector of schools.

A return will be made on the 1st of January of every year, to the Adjutant-General, of the number of 1st, 2nd, and 3rd class certificates of education in possession of the non-commissioned officers and men of every corps.

Blank forms of certificates will be supplied by the Council of Military Education, on the requisition of commanding officers.

By Command of His Royal Highness,
The Field Marshal Commanding-in-Chief,

JAMES YORKE SCARLETT,
Adjutant-General.

App. XVII.

The following INSTRUCTIONS, to be observed by SUPERINTENDING SCHOOLMASTERS, have been issued by the Adjutant-General.

A superintending schoolmaster is under the authority of the officer commanding the station to which he is appointed.

His duties will consist chiefly of—

1. Frequent visits to Army Schools.
2. Periodical Examinations.
3. Lecturing.

Visits to schools.

1. He is to visit each school at the station frequently, and at uncertain times; so that he may find them in their usual condition.

2. At these visits he is to observe the instruction given to each class, and to take notice of all that he sees; but he is not to give orders or to interfere, nor is he to make suggestions to the schoolmaster in presence of the pupils.

3. When he thinks that he can cause an irregularity to be corrected, or an omission to be supplied, by a word of advice to the schoolmaster, he is at liberty to offer it at a fitting opportunity.

Reports to Officer Commanding.

4. Within twenty-four hours of completing his visit he will submit to the officer commanding the regiment a summary of his observations on Form H.

5. On occasion of each visit he is to take care that an entry is made of the date of his visit in the visiting book.

6. He is to be ever ready to afford his opinion and advice when called upon to do so.

Half-yearly reports.

7. On the 31st July and 31st January of each year, he is to forward a full report, Form J, to the Council of Military Education. This is to be founded upon the notes and observations made at his visits during the six months ending with the 30th June and 31st December. This report is to be forwarded through the officer commanding the station, and a copy of it is to be sent to the Assistant Inspector of the District.

Out-stations.

8. A superintending schoolmaster may be required to visit or to examine schools at out-stations; but for all such duties he will receive special instructions from the Council of Military Education.

Annual examinations.

9. Every school must be examined at least once in every year.

10. To ensure that this regulation be carried out, the superintending schoolmaster will ascertain from each corps, on its arrival at the station, the date of its last examination by an Assistant Inspector or a superintending schoolmaster, and he will in no case allow twelve months from that date to elapse without a further examination of such school.

11. One month before the examination the superintending schoolmaster will arrange with the commanding officer for the precise date thereof, in order that, in the meantime, the regimental schoolmaster may examine every adult and grown child on the books, and record the results on Inspection Form D.

12. When holding the examination the superintending schoolmaster is to be present at the opening of the morning school, in order that he may report upon the Bible lesson given by the schoolmaster and the schoolmistress during the first half-hour; and he is to be present throughout the examination.

13. He will examine the several classes in each subject, in accordance with instructions contained in the examination books, and he will record the result in Tables I. and II. of the Forms A. and B., so far as respects the attainments of the pupils of the adult and grown children's schools who were present at the examination.

App. XVII.

14. He will see whether the schoolmaster's statements on Form D. are confirmed in respect to those who are present by the result of the examination; and he will report, for the information of the Council, whether that statement may be accepted as a fair representation of the state of education in the school.

15. He will inspect all the examination books of the whole school, both of pupils present and pupils absent; and having compared the work done at the schoolmaster's preliminary examination, or his own, with that done at previous examinations or inspections, he will note in how many cases progress has been achieved or otherwise, and he will enter the result in Table III. of Forms A. and B.

16. He will request the commanding officer to allow a holiday at the school on the day after the examination, and to permit the schoolmaster and his assistants to attend upon him in the schoolroom on that day, to assist in the examination of the books.

17. He will also examine the infant and industrial schools according to Form C.

18. Having filled in the tabular statements on Forms A., B., C., he will complete the general report of the several schools by supplying information under the several heads noted in those Forms; but he will not make any supplementary observations on the fourth page.

19. Within one week after the completion of the examination, superintending schoolmasters are to forward to the Council, through the commanding officer of the stations, Forms A., B., C., D., duly filled up. They will, at the same time, furnish the commanding officer of the regiment with an abstract of the report on Form E.

Certificates.

20. The superintending schoolmasters will conduct the examination of non-commissioned officers and soldiers who are candidates for certificates of education, whenever required to do so by the officer commanding the station. They will, with the assistance of the regimental schoolmaster, mark the errors in the candidates' examination papers, and transmit the latter for the decision of the assistant inspector. The examination questions will in all such cases be set by the assistant inspectors.

Pupil-teachers.

21. The superintending schoolmasters will examine, whenever required, candidates for the appointment of pupil-teacher, noting all errors in the candidates' papers, and transmitting the latter to the Secretary to the Council of Military Education.

General instructions.

22. It is the duty of superintending schoolmasters, by means of the half yearly reports and annual examinations, to keep the Council of Military Education informed of all that concerns the education of the soldier and his children; of the discipline of the army schools; of the moral character, manner, and temper of the teachers; their general treatment of their pupils, and their deportment towards their superiors. They are in no case, however, to make any reports to the Council of a nature reflecting on the administration, discipline, or efficiency of the schools which they have not previously made to the commanding officer.

Lectures.

23. Superintending schoolmasters are required to undertake the general management of lectures delivered to the troops, as well as to take a share in lecturing.

Travelling expenses.

24. When required by the Council of Military Education to visit or examine schools at out-stations, they are to submit quarterly to the Council their travelling charges.

H. App. XVII.

From Superintending Schoolmaster _____

To the Officer Commanding _____

_____ 18____

SIR,

I HAVE the honour to report that, in compliance with General Order _____ I visited the School of the _____ under your command, at the times specified in the margin, and to submit for your information the following remarks, made in conformity with directions printed on the last page, on

(1.) The Instruction.
(2.) The Discipline.
(3.) The Time Tables.
(4.) The Schoolrooms and School Furniture.
(5.) The Organization and Management.

I have the honour to be,
Sir,
Your most obedient servant,

Adult School - at ____ on the
" - at ____ on the
" - at ____ on the
Grown Children's School - at ____ on the
Infant and Industrial School at ____ on the

REMARKS.

DIRECTIONS TO BE OBSERVED IN MAKING THIS REPORT.

Superintending schoolmasters will carry with them the note-books (with which they will be supplied) whenever they visit a regimental school, and they will enter in them their remarks upon (1) Instruction, (2) Discipline, (3) Time tables, (4) Schoolroom and furniture, (5) Organization and management of the schools, as these come under their observation.

They will also record in them the precise time at which they entered and at which they quitted the schoolroom.

They will make use of their memoranda to complete their reports to the Commanding Officer. They will be careful to specify in their reports the particular schools which they visited (*i.e.*, whether adult or grown children, &c., &c.), and the time spent in each school. Under the different headings above enumerated, they are to observe particularly on certain points, viz.:—

1. Upon the character of the Bible lesson given by the schoolmaster or schoolmistress. Upon the character of the secular lessons given by the schoolmaster and schoolmistress. Upon the character of the lessons given by assistants.
2. Whether the pupils are orderly, attentive, courteous, and (in children's schools) clean. Whether the business of the school is carried on with regularity and alacrity, and without undue noise.
3. Whether the schoolmaster and schoolmistress appear to possess proper authority, and to exercise it with firmness and temper. Whether the assistants appear to have a sufficient education themselves, and to have a fair knowledge in teaching; and whether they appear to exercise authority themselves, and to support that of the schoolmaster and schoolmistress efficiently.
4. Upon the cleanliness and state of repair of the schoolrooms. Upon the state of repair, sufficiency, and suitableness of the school furniture.
5. In what respects, if any, the arrangements of the school are contrary to regulations, peculiar, or unusual.

App. XVII.

J.

Half-yearly Report by Superintending Schoolmaster _____
on the Schools of _____
at _____

_____ 186__

Date of Visit.	Adults' School.			Grown Children's School.			Infants' and Industrial School.		
	Hour of Visit.	Duration of Visit.	Number present.	Hour of Visit.	Duration of Visit.	Number present.	Hour of Visit.	Duration of Visit.	Number present.

REPORT.

OFFICE OF THE COUNCIL OF MILITARY EDUCATION, App. XVII.
13, *Great George Street*, 1*st October* 1864.

The following instructions for Assistant and Local Inspectors of army schools are substituted for those forwarded from this Office under letter of the 5th November 1862:—

Inspections.

1. Assistant Inspectors are to visit each station in their districts at least once a year.

2. Local Inspectors will, in addition to such occasional visits as they may think it desirable to pay to the schools in their districts, make at least one careful inspection and examination a year of each regimental school under their superintendence.

3. At stations to which superintending schoolmasters are attached, the examinations will be conducted by them, and the assistant inspector or local inspector will in that case be only required to inspect the school in its general working and condition. He will use, however, the enclosed forms for his report, omitting only those portions which refer exclusively to examination. It will be clearly understood that nothing that is here said is to prevent an assistant or local Inspector from holding an examination, in addition to the inspection, if he considers it desirable to do so.

4. The Forms, A., B., C., D., E., F., G., specimens of which are herewith enclosed, are to be used at all inspections held after the 31st October 1864.

5. One month before his proposed visit for the purpose of examination the assistant inspector is to address to the commanding officer an official letter, Form G. But this will not be required when his visit is one of inspection merely.

6. The Inspector is invariably to be present at the opening of the morning school, in order that he may report specially on the Bible lesson given by the schoolmaster and the schoolmistress during the first half hour.

7. The Inspector and the schoolmaster are to be present throughout the examination. The examination books are then to be taken charge of by the inspector.

8. He will examine the several classes in each subject, in accordance with the instructions contained in the examination books, and he will record the result in Tables I. and II. of the Forms A. and B., so far as respects the attainments of the pupils of the adult and grown children's schools who were present at the examination.

9. He will compare the general results of his own examination with those reported by the schoolmaster on Form D.; and he will report for the information of the Council whether that statement may be accepted as a fair representation of the state of education in the school.

10. The Inspector will inspect all the examination books of the whole school, both of pupils present and pupils absent, and having compared the work done at the schoolmaster's preliminary examination, or at his own, with that done at previous inspections or examinations, he will note in how many cases progress has been achieved, or otherwise; and he will enter the result in Table III. of Forms A. and B.

11. The Inspector will request the commanding officer to allow one or even two holidays to enable him to examine the pupils' books, and to permit the schoolmasters and the assistants to attend upon and assist him in this duty.

12. The inspector will also examine the infant and industrial schools according to Form C.

13. Having completed the tabular statement on Forms A, B, and C, he will complete the general reports of the several schools, by supplying

App. XVII.

information under the several heads noted in the Forms, together with any further observations that he may think it advisable to make.

Certificates.

14. Assistant and Local Inspectors are to examine candidates for certificates, and to recommend to commanding officers those men whom they may consider qualified, according to the terms of the several certificates.

15. At stations where there are superintending schoolmasters, the examination papers may be worked in their presence, and forwarded, with the errors noted, to the Inspectors for their decision. The questions, however, will in all cases be set by the Inspectors.

16. In reference to note (†) on the third page of Form A, the Inspector will understand that each certificate is to comprehend *the whole of* the subjects included under the respective standards therein named. This, indeed, will be evident from a perusal of the Forms of Certificate, but it is here noticed in order to prevent any chance of misapprehension.

Libraries and recreation rooms.

17. The Inspector is to report upon the Garrison Libraries and Regimental Recreation Rooms, on Form F.

Returns.

18. Within one week from the completion of the examination, he is to forward to the Council Forms A, B, C, D, and F; and he will at the same time forward to the Commanding Officer an abstract of his report on Form E.

General instructions.

19. It is the duty of an assistant or local Inspector to keep the Council of Military Education informed of all that concerns the education of the soldier and his children in the district assigned to his inspection; of the discipline of the army schools; of the teachers' moral character, their manner and temper, general treatment of their scholars, and deportment to their superiors; but he is to give no orders.

Annual report.

20. On or before the 31st January of each year, assistant and local Inspectors will lay before the Council of Military Education a General Report on the schools of their respective districts up to the 31st of the previous December, founded on the reports they have made on them at their inspections.

Travelling expenses, &c.

21. Assistant Inspectors will forward to the Council their claims for travelling and other contingent expenses at the termination of each quarter.

Correspondence.

22. All communications regarding army schools which the Inspectors may wish to make to his Royal Highness the Field Marshal Commanding-in-Chief, or to the Secretary of State for War, are to be sent through the Council of Military Education.

22. As it is very important that the assistant and local Inspectors shall be under no kind of misapprehension as to the working of the system now introduced, the Council request them freely to state any difficulty they may experience in regard to it.

By Order,
D. GREENTREE,
Captain and Secretary.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

SECOND REPORT

BY

THE COUNCIL OF MILITARY EDUCATION

ON

ARMY SCHOOLS, LIBRARIES AND RECREATION ROOMS.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

1865.

SECOND GENERAL REPORT

BY THE

COUNCIL OF MILITARY EDUCATION.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:

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PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

FOR HER MAJESTY'S STATIONERY OFFICE.

1865.

SECOND GENERAL REPORT

BY THE

COUNCIL OF MILITARY EDUCATION.

Presented to both Houses of Parliament by Command of Her Majesty.

REFORM CLUB
PALL MALL

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CONTENTS.

REPORT.

		Page
I.	Constitution and Duties of Council	3
II.	Appointment of Examiners	4
III.	„ Professors and Masters	5
IV.	Direct Appointments to the Staff	5
V.	Staff College Examinations	7
VI.	Artillery advanced Class	11
VII.	Effect of past Examinations generally	12
	Letters from Examiners	13
	Report continued	48
VIII.	Royal Military Academy, Examination for Admission to	51
IX.	„ „ Course of Instruction at	62
X.	„ „ Examination for Commissions in Royal Artillery and Royal Engineers	65
XI.	Royal Military College, Examination for Admission to	69
XII.	„ „ Course of Study and final Examination for Commissions	73
XIII.	Direct Commissions, Examination for	79
XIV.	Commissariat Department	84

APPENDIX.

I.	List of Professors and Masters appointed since last Report	85
II.	List of Officers who have passed for Direct Appointments to the Staff	86
III.	Staff College Regulations	87
IV.	„ Examination of Officers for admission to	92
V.	„ Examination papers used at the above in July 1864	94
VI.	„ Synopsis of course of instruction at	105
	„ Distribution of Time, Senior Class	117
VII.	„ Final Examinations at	121
VIII.	„ Examination papers used at the above in December 1864	135
IX.	Artillery Advanced Class, Regimental Order	151
X.	Royal Military Academy, Course of Mathematics proposed by Rev. Canon Moseley	153
	„ „ Course of Studies, Extracts from Regulations	158
XI.	„ „ Questions set at Examination for Commissions	162
XII.	Royal Military College, Analysis of Marks gained by Candidates for Admission to	189
XIII.	„ „ Synopsis of course of instruction at	195
XIV.	„ „ Questions set at Examination for Commissions	207
XV.	Commissariat Department—Rules for Examination of Candidates	221

SECOND GENERAL REPORT

BY THE

COUNCIL OF MILITARY EDUCATION.

I.

REPORT. L Council.

The Council of Military Education have the honour to submit to His Royal Highness the Field Marshal Commanding in Chief and to the Secretary of State for War the following Report on the state and progress of the general and scientific education of officers of the army.

The last Report of the Council contained their proceedings up to the 31st March 1860. Since that date there have been, with one exception, no organic changes in any of the colleges or departments connected with the Council. Such modifications as have occurred have been merely developments of the system laid down at the first appointment of the Council, and which experience has shown to be desirable. The exception referred to is in the Royal Military College, Sandhurst, where an important change, which will hereafter be described, has been made.

The constitution of the Council itself remains the same as it was at the date of the last Report. It consists of the Commander-in-Chief as *ex officio* president, of a vice-president and four members, one of whom is a civilian. The several services are represented in the Council by its members, who are selected from each branch ; while by the assistance of their civilian colleague, who had been intimately connected for many years both with the educational and the scientific world, the Council have been able to deal successfully, as they trust, with many difficult and important questions, which, without such aid, might have proved embarrassing.

The following changes have taken place in the Council since the year 1860. Major-General, now Sir Duncan Cameron, K.C.B., resigned the appointment of vice-president in March 1860, and was succeeded by Major-General Rumley, who resigned it in April 1861, and was succeeded by Lieut.-General Knollys. On General Knollys' resignation, in September 1862, the appointment was conferred on Major-General F. W. Hamilton, C.B., the present vice-president. In 1862 the late Major-General Portlock, R.E., F.R.S., one of the members of the Council, having resigned his appointment, was succeeded by Major-General Sir F. Abbott, C.B., retired full pay of Royal (Bengal) Engineers.

The general duties of the Council, exclusive of those appertaining to army schools, on which a separate report has recently been made, are as follows :—

1. The recommendation to the Commander-in-Chief and to the Secretary of State for War of gentlemen for the appointment of examiners in the army examinations.

2. The recommendation to the Commander-in-Chief and to the Secretary of State for War of the persons who appear to them the best qualified for appointment to professorships and masterships at the Staff College, the Advanced Class of Artillery Officers, the

REPORT.
II.
Examiners.

Royal Military College, and, under certain limitations, at the Royal Military Academy.

To report to the same authorities, whenever it may appear desirable to discontinue the services of gentlemen holding the above appointments.

To investigate and report, when required to do so by the Commander-in-Chief, upon the qualifications of officers proposed to be appointed to posts of educational superintendence.

3. To examine officers in certain subjects for direct appointments to the Staff.

4. To examine officers for admission to the Staff College ; probationarily during residence ; and for qualification for the general Staff on quitting the college.

5. To examine officers of Artillery for admission to the Advanced Class, and for certificates on quitting it.

6. To examine for admission to the Royal Military Academy, and for qualification for commissions in the Royal Artillery and Royal Engineers on quitting that Institution.

7. To examine for admission to the Royal Military College, Sandhurst, and for qualification for commissions in the army at the termination of the course of instruction.

8. To examine candidates for direct commissions in the Cavalry, Guards, and Line, and for appointment to the Commissariat Department ; to visit, whenever it may appear desirable, the educational departments of the Institutions above named ; and to report to the Commander-in-Chief on all questions connected either with the general education of candidates for the army, or with the educational departments of the several military colleges.

The above subjects will now be noticed in their order.

II.

Appointment of Examiners under the Council.

Since the date of the last Report one of the examiners in Classics, one in Mathematics, and one in Experimental Science, have resigned. The Council may be permitted to express their regret at losing the assistance of their late examiner in Experimental Science, Professor Tyndall, F.R.S., who took an early and important part in the movement for introducing physical science into English education, but whose more pressing labours in his own field of research compelled him to give up those of Examination.

The following is the present list of Examiners :—

Mathematics.—Rev. Canon Heaviside.—Rev. W. N. Griffin, M.A., late Fellow and Tutor of St. John's College, Cambridge.

Classics.—Rev. George Rawlinson, Camden Professor of Ancient History in the University of Oxford.—Rev. Osborne Gordon, B.D., late Censor of Christ's Church, Oxford.

English Language, English and General History, and Geography.—G. W. Dasent, Esq., D.C.L.—W. Stebbing, Esq., M.A., Fellow of Worcester College, Oxford.

French.—C. J. Savoye, Esq., late Professor in the College of Louis-le-Grand, Paris.—Alphonse Esquiros, Esq.

German.—Max Müller, Esq., Professor of European Languages, in the University of Oxford.—Rev. C. Schöll, Phil. Doctor, M.A., University of Tübingen.

Experimental Science.—F. A. Abel, Esq., F.R.S., Chemist to the War Department.—G. D. Liveing, Esq., M.A., Professor of Chemistry in the University of Cambridge.

Natural Sciences.—Warington Smyth, Esq., M.A., F.R.S., Government Inspector of Mines.—S. P. Woodward, Esq., F.G.S., of the British Museum.

Drawing.—Lieut.-Colonel Scott, Royal Engineers.—Rev. W. Kingsley, B.D., late Fellow and Tutor of Sidney Sussex College, Cambridge.

Fortification.—Lieut.-Col. Scott, Royal Engineers.

Military History.—Capt. J. P. Battersby, 60th Royal Rifles, Major of Brigade, Dover.

Military Administration and Law.—(For Staff College only.) Capt. Petrie, 14th Regiment, late of the Topographical Branch of the War Department.

Military Surveying.—Lieut.-Col. Scott, Royal Engineers.

The Council feel that they cannot too strongly express their sense of the valuable services which these gentlemen have rendered to them and to the cause of education. Their independence of any educational body which may furnish candidates for the examinations,* and their position in the literary, professional, or scientific world, afford the most satisfactory guarantee, not only for the integrity of the examinations, but also for the exclusion of that pedantry or narrowness of view which might effectually mar their efficiency.

III.

Appointment of Professors and Masters at the Military Colleges.

The selection as well as the recommendation of gentlemen for professorships and masterships at the Royal Military College, and the Staff College, Sandhurst, is by Royal Warrant confided to the Council. For similar appointments to the Royal Military Academy, Woolwich, the Lieut.-Governor of that institution receives applications, and recommends to the Commander-in-Chief, the candidate who appears to him the most eligible, his recommendation being then referred for the report of the Council. The Council are not aware what is the ground for this difference of practice in the two institutions. It probably arises from the Council's duties in respect to the Royal Military Academy not having been defined, as they were in the case of the Royal Military College, Sandhurst, by Royal Warrant.

The grounds upon which the Council make their recommendations of candidates for these appointments are, in general, University distinction, and subsequent success in teaching, as shown by testimonials, and the result of private reference. These conditions have of course to be modified in the case of Instructors in Military Science. But even here the Council deem it an important, though not a conclusive, advantage, that the candidates, if educated at Woolwich or Sandhurst, shall have taken a good place at the final examinations.

All appointments to Professorships or Masterships are probationary for the first year.

The appointments of Professors and Masters made at the several Military Colleges since the date of the last Report are stated in Appendix No. I.

IV.

Examination of Officers for Direct Appointment to the Staff.

The Queen's Regulations for the Army lay down at p. 62 that—

" Officers recommended for Staff appointments who have neither obtained

* It is an essential condition of the office of Examiner, that he be not engaged in the public or private tuition of persons who would be eligible to become candidates at the army examinations.

certificates at the Staff College, nor proved their fitness for Staff appointment by services in the field, will be required to pass an examination by the Council of Military Education;"

And the subjects prescribed are the following:—English Composition, one Foreign Language, Military Sketching, Field Fortification, Regimental Duty, and Tactics and Field Movements.

Officers who have attained the rank of Lieutenant-Colonel are exempted from this examination.

Direct Staff appointments will, with certain exceptions, cease as soon as all vacancies can be filled by officers who have passed through the Staff College. The following is the regulation on this subject:—

"As soon as the College shall be in a position to supply all vacancies in the staff of the army, no officer will be appointed to the staff who shall not have passed the Final Examination of the College, with the exception of those of the Royal Engineers, and of those who attained before the 1st January 1860 the rank of Lieutenant-Colonel, and in every case excepting officers of proved ability in the field."

From the Staff appointments here referred to, it has been ruled that those of Aide-de-camp and Assistant Military Secretary are to be excepted, these being considered as personal appointments, which are to continue to be filled on the direct nomination of general officers, and for which it is considered sufficient that the officer so nominated shall pass the examination above stated.

The officers who have passed through the Staff College are now sufficiently numerous to fill or nearly fill the vacancies in the lower appointments of the general Staff, such as those of Brigade Major, and Deputy Assistant Adjutant General, and Deputy Assistant Quartermaster General; consequently examinations for direct nomination to the latter have become very rare.

The Staff College has not yet been sufficiently long established to allow many of the officers who have successfully passed through it to obtain the higher Staff appointments, as, in general, those officers are not yet of sufficient rank to hold them.

Formerly the Council conducted the whole of the examination above detailed, but during the last year the examination has, upon their recommendation, been divided into two parts, — the one, in the subjects of Regimental Duties and Field Movements, conducted by a Board of Officers at a camp or garrison, whose report is transmitted to the Adjutant-General; and the other, in those of English Composition, Modern Languages, Field Fortification, and Military Sketching, conducted by the Council. The Council's examination is not held until the practical examination has been satisfactorily passed.

The names of the officers who have passed for direct Staff appointments since the date of the Council's last Report are given in Appendix No. II. The numbers examined were as follows:—

—	1860.	1861.	1862.	1863.	1864.	Total.	Passed on First Trial.	Passed on Second Trial.	Failed.
For Aide-de-Camp	7	8	12	7	9	43	37	4	2
„ Assistant Military Secretary	1	—	—	—	—	1	1	—	—
„ Brigade Major	—	1	1	—	—	2	2	—	—
„ Deputy Assistant Adjutant General	—	—	—	—	—	—	—	—	—
„ Deputy Assistant Quartermaster General	—	—	—	—	—	—	—	—	—
„ Assistant Adjutant General	—	1	—	—	—	1	—	—	1
„ Assistant Quartermaster General	—	—	—	—	—	—	—	—	—

V.

EXAMINATIONS OF OFFICERS FOR ADMISSION TO AND FOR QUALIFICATION AT THE STAFF COLLEGE.

The Staff College consists, as at the time of the Council's last Report, of 30 students. It is, however, somewhat differently composed. Officers of the Royal Engineers are now excluded, it having been decided by the higher authorities that their previous education and training were a sufficient preparation for the Staff. Of the 30 students, four may be officers of Artillery, and the remainder selected from the Cavalry, Guards, and Line. Only one officer at a time may be spared from a Battalion for residence at the College. The examination is competitive, with an obligatory qualification in mathematics and in one modern language. The regulations of the College are inserted in the Appendix No. III.

The requisite qualifications of Officers for admission to the College are :—

1st. A previous service of not less than three years, exclusive of leave of absence.

2nd. A certificate from his Commanding Officer, as follows :—

"I hereby certify that I have examined on the various subjects connected with his duty as a Regimental Officer, and more especially on the points which form the chief qualifications of a Staff Officer, with a view to his competency for admission to the Staff College, Sandhurst; and to the best of my belief and judgment I consider him, from his general knowledge of the service, his character, habits, and disposition, to be qualified for employment on the Staff, provided he pass the usual competitive examination for admission to the Staff College.

"He is a (good, fair, or indifferent) rider, and is not short-sighted."

Signature of Commanding Officer of Regiment - - - - } _____

Countersigned by the General of Brigade, or other Superior Officer - - - - - } _____

3rd. The candidate, if not a captain, to have passed the examination for a troop or company.

4th. A medical certificate of good health, and fitness for the active duties of the Staff.

The importance of the above requirements, especially the second, cannot be overrated. It is essential that the officer who is prepared at the public expense for the duties of the Staff should be intelligent, zealous, and efficient in the discharge of all his regimental duties. This condition fulfilled, the subsequent studies at the Staff College will be of the highest value in further cultivating the officer's intelligence and extending his information in the higher military subjects. Yet, important as this matter is, it is confessedly the most difficult of all to be satisfactorily worked out in practice. It is only natural that some commanding officers take a very different view from others as to the standard of efficiency as a regimental officer which should be required in a candidate for the Staff. In the opinion of the Council the standard can hardly be set too high. The Council have kept the point steadily in view, and in 1862 they proposed the stringent form of Certificate by commanding officers which is quoted above. Various schemes have been suggested, such as that of attaching candidates for a few months to the Staff of general officers, where it might be seen, before they are allowed to join the College, whether they possess that aptitude for business which is required. But this it is felt would but remove the responsibility one step higher. The terms of the requirement are in their nature vague, and liable to very different interpretation by those who have to pronounce upon the merits of the candidates. Admitting, how-

ever, to the fullest extent, the difficulty of ensuring that all the officers who present themselves for the competitive examination for admission to the Staff College shall be well fitted in all respects for Staff employment, the Council have every reason to believe that the College produces under the present system a fair proportion of officers highly qualified for their future duties. Further, when the system shall have been some years longer in operation, there will be the means, never before possessed to so great a degree, of selecting for the higher appointments officers who have proved not only their general ability at the College, but also their aptitude for duty in the subordinate appointments of the Staff.

The competitive examination of officers on home service for admission to the College is held in the hall at Chelsea Hospital ; for that of officers on foreign service, the examination papers are sent out to the care of general officers commanding, and are answered in the presence of a Board of Officers appointed for the purpose.

The subjects of the examination comprise Mathematics, Military History and Geography, French, German, Hindustani, Fortification, Military Drawing, Chemistry, Geology. Of these, only the Elementary Mathematics and one Modern Language are obligatory. Success is determined by the totality of marks obtained.

In Appendix No. IV. will be found Tables of the results of the examinations held for admission to the Staff College, in continuation of those recorded in the Council's last Report. The Question Papers used at one of those examinations for admission are also inserted. (App. No. V.)

The course of study at the College for 1863 is printed in Appendix No. VI. The time tables of study are also inserted. The student is required to attend every lecture in Military History and Military Administration and Law, and also all out-door practical operations connected with the study of Fortification and Military Surveying. In other subjects which he may take up, he is required to attend two thirds of the lectures.

At the end of the first year of residence there is an examination of the students, under the direction of the Council. The result of this determines whether the student is sufficiently advanced to remain at the College with fair prospect of ultimate success. No case has yet occurred of rejection at this examination. The student at this and at the final examination, which takes place at the end of the second year of residence, is examined in, at the most, seven subjects, of which four must be the essentially military subjects taught at the College ; viz., Military History, Military Administration and Law, Fortification, and Military Surveying and Reconnaissance. The remaining subjects may be selected from those of Mathematics, Modern Languages (each language counting as a subject), Natural Science, and Experimental Science. The marks allotted to the respective subjects, and other details connected with the final examination, are stated in Appendix No. III. Only one subject, that of "Military Surveying and Reconnaissance," is made obligatory for qualification ; the general condition of success being that the students obtain a certain aggregate of marks, which is fixed sufficiently high to ensure a reasonable degree of ability and application in those who pass.

The limitation to seven subjects was sanctioned by His Royal Highness the Field Marshal Commanding in Chief, on the recommendation of the Council, in 1862. The students had previously been permitted to take up all the subjects taught at the College, and those who availed themselves fully of this liberty took up as many as ten

different subjects. Although this system was not without its advantages in extending the accomplishments of the officers, it was found that these were dearly bought, in many instances, at the expense of depth and thoroughness of work. Whether the limitation has been carried far enough, can only be decided by a longer experience of the working of the present arrangement. But there can be little doubt that if any further changes be made, they will be in the direction of limitation rather than of extension.

Another important change, which was made in 1861, must here be noticed. Formerly the students were required to obtain a certain proportion of marks in each of the following subjects:—Mathematics, Military History, Military Administration and Law, Fortification, Surveying and Reconnaissance, and the French Language. This had the advantage of securing sound work in each of those subjects. But on the other hand it tended to produce very serious anomalies in individual cases. A student whose general work was excellent might fail in a special branch, and thus be disqualified. It was felt to be more equitable to require an aggregate of marks on the most important subjects, and to set this aggregate high enough to ensure that a student who failed in one subject should have to compensate for his failure by very superior acquirements in another.

This principle, which the Council are of opinion, from an experience of several years in the working of examinations, is a most important one where the examination comprises several subjects, has also been acted on in the examinations for Commissions at the Royal Military College, Sandhurst, and at the Royal Military Academy, Woolwich. Obligatory subjects may indeed in some cases be necessary, and in the examinations for admission to the Royal Military Academy and the Royal Military College, as well as in that for Direct Commissions, they are still resorted to; but it is nevertheless certain that the more they can be dispensed with, the more will the examination harmonize with the general education of the country.

As regards the instruction at the Staff College, every effort has been made to render it as directly practical as the circumstances will admit of. Even the mathematical teaching, abstract as to some extent it necessarily is, has been directed to this end. A treatise on Practical Mechanics, which is used by the students, has been drawn up by the Professor, the Rev. J. F. Twisden, with the aid of the Rev. Canon Moseley, entirely with this view.

In all the other subjects of instruction the same practical end is kept in view. In Fortification the students are assisted in the practical operations by the detachment of Royal Engineers stationed at the College. In Military Surveying they are practised in rapid eye sketching, as well as in surveying with instruments, and they also learn the principles of road making. In all these subjects they study under the direction of the Professors. In that of "Reconnaissance" they receive their instruction from the Commandant of the College.

Positions are selected in the neighbourhood for supposed occupation and defence by troops of the several arms; the lines of route with the adjacent country are sketched, and the accommodation that the several towns, villages, and hamlets could afford, and all other matters on which information is required, are explained in a report.

On the recommendation of the Commandant, which was entirely concurred in by the Council, an important extension has been given in the present year to this study. The officers who were on the point of completing their term of residence were divided into parties, and surveyed the country on four different lines from the neighbourhood of the

College to a point on the south coast, assumed as that of an enemy's debarkation, obtaining the military statistics of the towns and villages they passed through, noting favourable positions for defence, and, in short, performing, as far as possible, the same duties of reconnaissance as are performed by the officers of the Quartermaster General's Staff in the field. The whole were under the direction of the Commandant in person. When the sketches and reports are completed, they are forwarded to the Quartermaster General's Department. It is hoped that after this practice has been for some years in operation, and several different lines of country shall have been so surveyed, the results may have a value in the way of information and suggestion, beyond their mere educational value, although the latter is undoubtedly very great.

The lectures in Military History give an opportunity of studying deeply and thoroughly the accounts of the campaigns of great commanders, and through them the principles of military art. The lectures on Military Administration embrace the whole detail of that subject, both in respect to peace and war; and the lectures on Military Law are chiefly on the principles and practice of courts-martial. In the study of Modern Languages great stress is laid on composition. In that of Geology the aim is still to render the instruction as far as possible an aid to the future duties of the officer, by shewing the relations of geological formations to surface-features, thus connecting Geology with Surveying; and in the Experimental Sciences, by showing their application to military purposes, particularly in the explosion of mines, and in electric telegraphy as adapted to the field.

In Appendix No. VII. will be found the results of all the examinations of officers on quitting the College which have been held since those recorded in the last Report. The following is an abstract :—

Date.	Passed.	Failed.
December 1859 -	10	2
„ 1860 -	16	4
„ 1861 -	13	3
„ 1862 -	14	0
„ 1863 -	13	0
„ 1864 -	13	0
Total -	79	9

The examination papers used at one of the final examinations are inserted in Appendix No. VIII.

After quitting the College, the officers who have been successful in their examination are attached for a short time to other arms of the service, "for the purpose of acquiring instruction in those duties and field movements which are not common to their own." The period allowed for this purpose, which was formerly four months, has recently been reduced to six weeks with each arm. As the relations of the officers with the Council cease after passing their final examination at the Staff College, the Council are unable to report upon this portion of their training, which, however, they cannot but regard as a most valuable part of the general plan of instruction of the Staff officer.

On the successful termination of these several courses of military instruction, the officers, if there is no immediate opportunity for employing them on the Staff, return, it is understood, to their regiments, and are eligible for Staff employment, upon occasion offering, during

their subsequent military career. The initials "p. s. c.," signifying "passed the final examination at the Staff College," are appended to their names in the Army List, and their claims for employment are urged upon the attention of general officers in command in the following General Order of the 28th Feb. 1861 :—

"It being desirable that the claims to Staff employment of officers who have passed the final examination at the Staff College, and have fulfilled the requirements of the regulations dated 23d January 1860, should not be lost sight of, the General Commanding in Chief directs the attention of general and other officers commanding at the different military stations at home and abroad to the General Orders issued periodically from this Department, publishing the names of officers who have passed successfully through the College; and His Royal Highness desires that on the occurrence of a vacancy on the Staff in any command where there may be serving an officer who has qualified himself at the Staff College (or at the late Senior Department of the Royal Military College), and whose rank may render him eligible for the vacant appointment, such officer should, as a general rule, be recommended to fill the same, in preference to one who has not undergone that ordeal."

VI.

The Artillery Advanced Class.

In September 1862, a memorandum was submitted to the Field Marshal Commanding in Chief by some officers of the Royal Artillery, urging the expediency of forming within that regiment a body of officers possessing mathematical and mechanical science sufficient to grapple with questions of great interest and importance, arising out of recent improvements in the science of Artillery. It was argued that such knowledge could not be imparted during the course of instruction at the Royal Military Academy, and that it became, therefore, necessary to establish a special class for officers who had already had some experience in the duties of their profession.

A favourable view of this suggestion having been taken by His Royal Highness the Field Marshal Commanding in Chief and the Secretary of State for War, the Council were called upon to draw up a scheme for carrying it into effect by establishing at Woolwich a class of 10 officers. The Council accordingly submitted a scheme on the 10th April, and it received the sanction of the Secretary of State on the 21st July 1863. The Council thereupon instituted inquiries for a suitable educational staff; and at their recommendation Major Young, R.A., who had long held the post of Director of Artillery Studies, was appointed to the charge of the class, assisted by Captain Brackenbury, R.A. The Rev. F. Bashforth was appointed Professor of Applied Mathematics. This gentleman had obtained high University distinction at Cambridge, and he had since that time turned his attention to questions of Applied Mathematics. Mr. C. L. Bloxam, Lecturer at the Royal Military Academy, was appointed Lecturer in Chemistry to the new class. Dr. Percy, F.R.S., although deeply engaged in professional occupations, was induced, by the interest which he felt in the Royal Artillery, with whom he had for several years been associated, to give his aid by accepting the Lectureship on Metallurgy.

Professor Goodeve has been appointed Lecturer in Practical Mechanics and Physics.

In November 1863, a Regimental Order (see Appendix, No. IX.) was issued to the Royal Artillery, appointing the month of March 1864 for the first examination for admission, and detailing the subjects of examination, as well as the qualifications required of candidates. It had been intended, as specified in the Regimental Order, to insist upon a previous course of instruction at Shoeburyness; but as the only course acknowledged by the authorities of the School of Gunnery

extends over a year, and as the school had not been many years established, a strict compliance with this requirement would have excluded several eligible candidates. His Royal Highness, therefore, allowed the course at Shoeburyness to be commuted to a searching examination on artillery subjects, conducted by the Commandant of the School of Gunnery.

It will be observed that the test for qualification at the first examination was set at a low standard. This was purposely recommended by the Council; for the project being entirely new, the officers of artillery could have but little time for preparation; and although many might have formerly distinguished themselves at the Royal Military Academy, yet it would have been unreasonable to expect that they should have kept up their theoretical knowledge to the point required to pass a searching examination. Should the class become popular in the regiment, competition will naturally raise the standard. In default of competition, it may become necessary to impose more rigid terms; and this will be quite legitimate when more time for preparation shall have been afforded.

On the 30th March 1864, owing to the shortness of the notice, only seven officers presented themselves in England, and two at foreign stations. Of these candidates, eight satisfied the Council as to their competency to undertake, with reasonable expectation of success, the proposed course of studies; and the class was opened in May last.

A Return of the officers examined will be found in Appendix No. IX.

VII.

The foregoing part of this Report treats of the action of the Council of Military Education in reference to the appointments of Examiners and of Professors at the Military Colleges, and to the military education and examination of officers already in Her Majesty's service. The following part of the Report has reference to the examination of youths destined for the several branches of the service, and to the education provided for those who enter the Royal Military Academy, Woolwich, and the Royal Military College, Sandhurst. It is at this point, therefore, that the operations of the Council affect directly the general education of the country. It is evidently a matter of extreme importance, and one on which it is desirable that the fullest information should be afforded. The Council have, therefore, requested each of the examiners employed in the army examinations to furnish them with their opinion as to the results which have been attained, and to add any further observations which they may think desirable. As these gentlemen are brought into immediate contact with the general education of the country, as represented by the several classes of candidates who come before them, and as they, of all others, have the best means of judging of the actual results, the Council feel that they cannot do better than publish their statements in full. This of course does not imply that the Council are prepared to adopt necessarily every proposition that is advanced, although they are happy to express their general concurrence with the opinions stated.

The following letter, varied in some instances according to the nature of the subject of examination, was addressed by the Secretary of the Council to the respective Examiners, and the several replies are subjoined:—

13, Great George Street, Westminster,
12th May 1864.

Sir,

The Council of Military Education being about to present a General Report to the Field Marshal Commanding in Chief and the Secretary

of State for War, in which the army examinations will necessarily have a prominent place, I am directed to request you to furnish them with a report of the result of the examinations you have conducted in————for Direct Commissions, for admission to the Royal Military College and Royal Military Academy, and for obtaining Commissions from those institutions.

The subjects that naturally suggest themselves are:—

1st. The present state of knowledge shown by the candidates, as compared with that shown by them at the first examinations held by you,—whether progress is indicated, and, if so, to what extent.

2nd. Whether in the event of any progress having been observable, it is still maintained; or whether, on the other hand, the maximum of attainment to be expected under the present circumstances of education appears to have been reached.

3rd. In what particular branches of your subject the candidates show usually a good or bad state of preparation.

4th. Whether the grounding appears to have been generally attended to in the majority of those whose attainments in your subject are respectable; or whether, on the contrary, the knowledge displayed seems to have been hastily and superficially got up.

5th. In respect to the final examinations at Sandhurst and Woolwich, the character of the answers, as compared with those given at the examinations for admission, will deserve attention, as showing whether improved mental training, as well as actual progress, is discernible. The Council will be glad also to be favoured with the opinion you have formed as to the quality and usefulness of the instruction, both in itself, and as a groundwork for an officer's future studies in your subject, should he be desirous of pursuing them.

The Council have directed me to mention the above points, but I am at the same time to request you not to limit your observations to them, but to report freely on any subject on which it may appear to you of public advantage that information should be given in connexion with the subject in which you examine.

I have the honour, &c. &c.,
(Signed) D. GREENTREE, Captain,
Secretary.

To the Examiner in _____.

REPLIES of the EXAMINERS.

From the Rev. Canon HEAVISIDE, Examiner in Mathematics.

In reply to your letter of May the 12th, I have the honor of forwarding the following remarks on the results of the examinations which I have conducted "for Direct Commissions, for admission to the Royal Military College and the Royal Military Academy, and for obtaining Commissions at those institutions."

I will first draw your attention to the examinations for Direct Commissions and for admission to Sandhurst, which are nearly of the same character and subject to similar conditions.

The obligatory parts of the Mathematical Papers were, during the first years I examined for the Council (1858, 1859), as respects arithmetic and algebra, of a slightly *less* simple character than they now are, so that it would be hardly safe to draw comparisons from the number of failures (larger than at present) which occurred in those years; in July 1860 the Council issued instructions to the mathematical examiners to include questions of a more simple and direct character in their arithmetical papers, and since that time the Examination Papers seem to me, as nearly as possible, to have preserved a uniform standard.

Were I writing without the power of referring to my marks, I should say unhesitatingly that there has been a great improvement in the qualifications and preparation of the candidates as exhibited from time to time, but I am not left to vague impressions. As the best test of improvement, I refer to my marks. Taking the year 1861, when the new regulations may be supposed to be thoroughly established, I find I examined three times for Direct Commissions—in January, May, and August.

In May 1863 and in May 1864 I also examined for Direct Commissions, the other examinations in those years falling to my colleague.

I propose to institute a comparison between the results of the three examinations in 1861, and the two examinations in 1863 and 1864, in the following particulars: (1), the comparative number of failures; (2), the number of candidates that obtained at least 800 marks out of 1,200 allowed to the obligatory subjects; (3), the number of candidates that attempted the voluntary subjects.

In January 1861, 10 were stopped in mathematics out of 124.
In May 1861, 4 „ „ 124.
In August 1861, 14 „ „ 144.

On the three examinations, 28 were stopped in mathematics out of 392, or 7 *per cent. nearly.*

In May 1863, 4 candidates were stopped in mathematics out of 143.
In May 1864, 4 „ „ „ 150.

On the two examinations, 8 candidates were stopped in mathematics out of 293.

That is 2·7 or nearly 3 *per cent.*

In January 1861, 64 candidates, out of 124, obtained at least 800 marks.
In May 1861, 75 „ 124 „
In August 1861, 53 „ 144 „

On the three examinations, 192 candidates, out of 392, obtained 800 marks, or 49 *per cent.*

In May 1863, 89 candidates, out of 143, obtained 800 marks.
In May 1864, 94 „ 150 „

Or on the two examinations, 183 candidates, out of 293, obtained 800 marks; that is, 62·4 *per cent.*

In January 1861, 44 candidates got marks for the voluntary subjects.
In May 1861, 44 „ „
In August 1861, 47 „ „

Or 135 out of 392 candidates got marks for the voluntary; that is, 34·4 *per cent.*

In May 1863, 86 candidates obtained marks for voluntary.
In May 1864, 65 „ „

On the two examinations, 146, out of 293, or 50 *per cent.* nearly.

I may also add that the marks obtained for the voluntary were higher in the examinations of 1863 and 1864 than in the examinations of 1861.

By every one of these tests the improvement is unquestionable.

Although my impression of the improvement in the qualifications of the candidates for admission to Sandhurst remains, yet the statistics furnished by my examinations are not so striking as in the case of the Direct Commissions. I examined for admission to Sandhurst both in June and December 1861.

I examined only once last year, namely, in June 1863.

Applying the same tests as for the Direct Commissions in comparing the examinations of 1861 with the examinations of 1863,—

In June 1861, there were 4 failures out of 71 candidates.
In December 1861, „ 5 „ 81 „
In 1861 there were 9 failures out of 152 candidates, or nearly 6 *per cent.*
In June 1863 there were 18 failures out of 156 candidates, or 11·5 *per cent.* In this case it is against 1863.
In June 1861, 45 out of 71 candidates obtained 800 marks.
In December 1861, 30 out of 81 „

On the two examinations, 75 out of 152 candidates obtained not less than 800 marks, or 50 *per cent.*

In June 1863, 89 out of 156 obtained 800 marks or 57 *per cent.*
In June 1861, 46 out of 71 took up voluntary.
In December 1861, 49 out of 81 „

Or in 1861, 95 out of 152 took up voluntary, that is, 62·5 *per cent.*
In June 1863, 114 out of 156 took up the voluntary subjects, or 72·4 *per cent.*

The marks also on the voluntary subjects (1863) indicate a decided advance over those of 1861.

As to the Commission Class on leaving Sandhurst, I feel great confidence in saying that the advance of the cadets has been steady and uniform; but the forms of the examination not always remaining the same, I have hardly data for a statistical comparison.

It would be hazardous to pronounce an opinion as to whether the improvement in the Direct Commission examination and in the admission to Sandhurst has reached a maximum. For the Direct Commissions I should be inclined to think it had, but the admission to Sandhurst examination must be considerably affected by the average number of vacancies, and not only by the vacancies for Sandhurst, but also by those at the Royal Military Academy, Woolwich, for I have no doubt when a number of good candidates fail for Woolwich from a short allowance of vacancies, many of them present themselves for Sandhurst, and thus improve the character of that examination also. Perhaps in a degree the failure of candidates for Woolwich may have favourably affected the general result of the Direct Commission examination, from the like cause.

On the whole I beg to repeat that my decided opinion is that these examinations have, so far as the subjects go, provided a class of officers for the army better educated than formerly.

Admission to the Royal Military Academy.

The mathematical examination for admission to Woolwich is of a much more searching and extensive character than either of the examinations just spoken of. There can be no doubt of the improvement in the qualifications of the candidates during the period that these examinations have been under the Military Council. This arises from many causes. The competition is more severe, the vacancies are fewer than at first, systematic preparation for the examination is more general, and the number of hopeless candidates that present themselves rapidly diminishes, arising, no doubt, from the qualifications required being better understood. I think, too, the examination itself has been improved in form; a greater necessity exists for a good grounding in the elementary subjects; and without saying that there is not still room for improvement, I think the alterations that were first introduced in January 1863 have contributed in no small degree to secure an average of candidates better prepared in their mathematical studies in every successive examination. I do not mean to say that the best candidates now are better than the best candidates were four or five years ago, but I am sure that the worst of those now chosen for Woolwich are far above the worst that were admitted at the earlier period.

The Council may remember that from time to time and particularly since the last change in January 1863, I have furnished them with remarks in my reports, pointing out the improvement from statistical details; and, as my last report shows, there has been a considerable advance in comparing the examination of January 1864 with that of the preceding July 1863. I need hardly repeat the details of that report, but they are striking in establishing the general result of improvement, more especially in Section I., which section includes the subjects where the good grounding of the candidates is to be looked for. As far as my single examination was concerned, I find, by reference to my report of January last, that the average number of marks obtained by each candidate was, in July 1863, 405·18, whilst in January 1864 that average amounted to 460·74. If the vacancies at Woolwich for the last two years represent the average for the future, I do not see why the improvement may not be maintained for some time to come. Although the number of candidates that present themselves may not increase, or may even diminish, yet it may be true that the severity of the competition will increase, for it must be remembered that the candidates are now to a great extent "picked" by the tutors before they are examined by us; the hopeless cases are eliminated in the training; indeed, in most cases those only who have a reasonable chance are pushed forward for the actual trial. I know several instances in which young men have been sent to tutors accustomed to prepare for Woolwich, who have been told that they have no chance, and who have given up the attempt in consequence; and it is probable that particular cases of the like kind may have fallen within the experience of most of those who are connected in any way with the Woolwich examinations.

REPORT

VII. Examiners' Letters.

With regard to the examinations at Woolwich for Commissions, official communications have recently been received by the Council, with the complaint, that some candidates are admitted to the Academy who, from want of sufficient grounding, fail to satisfy the half-yearly tests of passing in mathematics. I have recently had the honour of remarking to the Council on those communications. I cannot enforce too strongly my opinion that it is most desirable that a cadet on entering Woolwich should be thoroughly at home in the elementary subjects of Arithmetic, Algebra, Euclid, Plane Trigonometry with its applications, so as to be able to apply them to his indispensable professional attainments, Surveying, Mensuration, and such like; but the prescribed course of mathematics in the Academy is an advanced one, and thoroughly to master these different branches theoretically, requires not only mathematical aptitude, but a greater length of time devoted to those studies, than is, I believe, allowed at Woolwich; and I do not wonder that many cadets who just clear the minimum at admission, and get into the Academy by classics, modern languages, and other subjects, fail when there of satisfying this high mathematical test. I cannot but repeat, that if, on admission, proficiency in classics, &c. is to compensate in any degree for mathematics, these failures must often occur, unless something of the same system of compensation be allowed at the Academy Examinations. For the Engineers, the higher subjects might be insisted on, and more time be given to mathematics; but for the Artillery I submit for the consideration of the Council whether a portion of the present mathematical course at the Academy might not be made voluntary. The best cadets at Woolwich that I have examined pass an excellent examination, and show that they are capable even of scientific eminence, but there are some whose higher mathematics are of that character that an examiner feels that the time of the cadets might have been more profitably expended on other subjects. I have sometimes thought at Woolwich (more in former examinations than in the recent ones) that the cadets were not sufficiently practised in writing out their book work, so as to go through their demonstrations in a clear and logical form. Easy problems and examples they do better than their book work, and it has struck me that this may have arisen from their being pressed to hurry over their subjects too rapidly. I have observed upon this deficiency before; but I am bound to say, that in the last examination I conducted at Woolwich considerable improvement had taken place in this respect.

As I have been invited by the Council to report freely on any subject connected with their examinations, it may not be considered altogether out of place if I make some remarks on competitive examinations generally, and note a few of the objections that have been made concerning them.

It has been objected, for instance, that a merely literary examination will fail to detect many qualities that tend to make an efficient officer; all physical excellences are entirely overlooked; and where accuracy of eye, readiness of decision, promptitude in combination, and various other qualities, are required, the selection is made without any reference to such advantages. No doubt there is truth in this; but the moment it is decided to throw open coveted appointments to the public, to be given without favour or patronage, there is really no other mode of selection practicable except by the examination test; and I am not aware that, under any system of patronage, attention to these desired qualities named has ever been made an ingredient in the choice. If reliance has been felt hitherto that the officers of the British army would not, as a body, be found wanting in these essentials, I know not why it should be assumed that there is any greater chance that young men should be found deficient in them because they devote to study and mental improvement some part of the time they would otherwise have frittered away. It is said sometimes, "book-worms" are not wanted; and I will allow that I have seen in my life a very few youths so absorbed in some curious branch of learning as to be unfit for the active concerns of life, but "book worms" such as these are very rarely met with, and it would be the greatest mistake to suppose that anything proposed to candidates in these military examinations tended to foster such peculiarities. Were I to appeal to a university experience, I should say that most of those who had addicted themselves with the greatest success to university studies were just those who in their after career had shown themselves most competent in the administration of matters connected with practical life. The votaries of boating and of cricket have often been as

conspicuous for success in university honors as they have been on the river or in the field. The fact is, that young men cannot give themselves up to an idle life without incurring great risk of becoming dissolute also; with a dissipated life come loss of nerve, inaptitude for steady attention, and bad habits generally; and is not the danger to the British army in this direction far greater than from any of the evils that are supposed to result from the stimulus of a competitive examination? I know not whether it would be possible to add to the literary test any physical one, such as height, weight, breadth across the chest or shoulders, or even excellence in some particular to be chosen by a candidate himself, such as swimming, riding, shooting, cricket, &c.; but a literary test of some kind there must be, if a selection from the public is to be made, otherwise the simple art of reading and writing might not be required in a British officer; and if no examination founded on education is to be applied, a ploughboy or a prizefighter might be found the most eligible candidates for commissions in the army.

Another and a more plausible objection is often urged, that examinations encourage a system of "cramming." Let me attempt to clear this obnoxious word of some of the obloquy which now attaches to it. Many people use the phrase until they think it applicable to any steady preparation for a prescribed examination; this surely cannot be objectionable, whatever name it goes by; there is no better security for true and exact knowledge of a subject than by ascertaining from time to time that a student can reproduce his knowledge in an intelligent and literary form; this, in fact, is "taking stock" of his progress, and instead of encouraging a loose and desultory mode of learning, the examination system is intended to have, and in fact has, the very contrary effect. But there is a species of preparation to which the word "cram" has not been improperly applied. It belongs rather to examinations of a low than of a high standard, and works principally where no very searching qualifications can be insisted on. "Cram," as contrasted with knowledge, is the result of a system of indoctrination devised by ingenious tutors for supplying their pupils with a method for picking up a few marks in an examination in a subject which they have not the time or the capacity to study in a regular and systematic way. A few illustrations will best explain my meaning.

Supposing a lad has, in a hurry, to pass an examination in a part of a prescribed classic, say a book of Virgil. From idleness or neglected education he knows nothing of Latin, nothing of the grammar or the construction; he can do little more than read the words. A youth of ordinary abilities will soon be taught by a good tutor to be able to construe on paper any passage from this book of Virgil; by means of translation, marking the words, by continual repetition, the translation of the book, almost word for word, may be learnt, though the youth would not be able to put a nominative case to a verb in any other classical book. This is "cram;" this is knowledge which is of no real use, which is available for the particular examination, and forgotten as soon as delivered up. So, of History. The master will take the salient points, say of the reigns of the Kings of England, catechise upon them unceasingly, write down dates for the memory, at most give a syllabus or the smallest abridgment to be read, and by dint of repetitions of this kind will prepare a candidate to scrape through in a History paper. Cramming is not so easy in Mathematics, still there is room for it. In Euclid the tutors will mark propositions likely to be set; they will observe whether long or short propositions will probably suit best the examinations, and prepare accordingly. Arithmetic, I think, must be properly learnt and be properly done, but in Algebra a few formulas may be speculated upon; youths may be trained to do a few simple equations, without fairly reaching that part of the subject, and so perhaps an examination may be got through. Whatever is to be said against "cramming" properly applies to such methods as I have described; the knowledge obtained is, as knowledge or mental training, worth little or nothing; but let it be observed that it is in those examinations where much cannot be required that this kind of preparation is most available; as the qualifications needed are lower so is the scope for cramming enlarged, and those who would get rid of it altogether must do so by urging that examinations should be made more searching, in other words that a considerable per-centage of those who now pass should be excluded. In the competitive examinations for admission to Woolwich, I believe that cramming in Mathematics would be of little avail. Certainly in Section I. the exami-

nation is so complete that a proper reading of the subjects would alone serve for a good place in the examination; possibly in the Differential Calculus, where a small range of questions is prescribed, or in the Mixed Mathematics, a few marks may be obtained by successful speculations, but I believe the cases must be very rare where such a superficial knowledge of the subject has really aided in bringing the candidates within the line of success. Should such be the case, I have recently pointed out to the Council how it might be counteracted in some degree, viz., by requiring a minimum, say one-fifth, of the marks in these subjects to be gained, before they shall count for the general total.

But even where cramming, on account of the lowness of the qualifications, is most available, may not some apology be offered for it? If the candidates were not "crammed," would they learn anything at all? Cramming for a particular purpose supplies the omissions of a neglected education, and if a candidate thus learns little, he learns that something is to be learnt of which he would otherwise be hopelessly ignorant. And after all, when we are told that quickness, and smartness, and tact, and readiness at an expedient, are qualifications which are desirable in a British officer, are not these qualities shown in some degree in the facility with which a candidate can be "crammed?" A clever lad with a neglected education will pick up his crumbs of knowledge n half the time that a stupid lad will do it, and his scraps will tell with far greater effect, so that in this sense cramming itself may afford some test of qualifications that will have their better uses afterwards.

These examinations stand, however, but at the threshold of the military profession; so far as these literary tests are concerned it is competent for us to express an opinion of their success and the progress that has been made; but the changes that have been introduced by this mode of selection will be judged of, in the end, by their results.

If the officers of the British army, from the ensigns to the generals, do not partake of the improvement which is begun by your Council, it will be vain to urge any theoretical arguments for selection by examination; but as in all other departments of the state superior education and high mental qualities become every day more necessary and more conspicuous in our public servants, so I trust and believe that none of those characteristics which have shed such a glory over the service in the past, will be wanting to the officers of the British army in the future, because some security has been required that candidates for commissions should start in their career partaking of that improvement in education which belongs to all the other classes and professions of their contemporaries.

J. W. HEAVISIDE.

From the Rev. W. N. GRIFFIN, M.A., Examiner in Mathematics.

MY experience in the examinations in which I take part under your direction is hardly long enough to allow me to trace the progressive knowledge of the several groups of candidates who come before me. I feel also unable to measure the advancement which cadets make at Sandhurst and Woolwich, from want of sufficient opportunities of comparing the answers given in at their final examinations with those given in at admission.

While under these heads I regret that I cannot offer to the Council any opinion worth their attention, I would attempt to describe my impressions, as to mathematical knowledge and power, of the candidates who have been before me at Chelsea. They are, I think, clearly divisible into three grades, as they present themselves—

for direct commissions;
for admission into the Royal Military College;
for admission into the Royal Military Academy.

I. Candidates who are passed for direct commissions usually do arithmetic well, in the form of the ordinary computations which I am instructed to set, and in this respect they show themselves qualified for what I apprehend to be

the duties of a regimental officer. They have read so much of Euclid as cannot fail to have a good educational effect on them. The Algebra is elementary, hardly extensive enough to let them feel the power of this instrument, and few show readiness to express in Algebra the conditions of a problem. In the subjects left as voluntary, several candidates have usually been taught to use logarithms, and some few can do questions in heights and distances. The questions in Mechanics, elementary as they are, are seldom attempted.

II. In the one examination for the Royal Military College in which I took part, all subjects seem advanced beyond the condition which I have just described; more power shown in Algebra; Trigonometry well done by a fair number of candidates.

III. For admission into the Royal Military Academy I find candidates of still more advanced mathematical cultivation. Arithmetic, Algebra, and Euclid are generally good, Trigonometry handled with readiness and accuracy, all indicating good teaching and minds capable of profiting by it. And this I can say while the majority of those who offer the voluntary subjects are weak in them; and it is, I believe, because they have not yet had time to dwell on them sufficiently, and mature them by working examples.

I cannot on the whole complain of students being hurried too fast into higher subjects. The repeated warnings published by the Council seem to have corrected this error. Nor do I often detect signs of the higher subjects being unfairly read with a view to anticipated questions, but they are honestly in progress, though as yet too incomplete to win much credit in an examination.

Looking onwards to the professional life of officers, I cannot think that many of those who obtain direct commissions are in a condition to carry forward their mathematical studies in their regiments, with daily active duties upon them, and good instruction not always to be had; but I would have good hope that those who go out from Sandhurst and Woolwich have the power in themselves, if they are so inclined, of continuing their reading in Analysis and Natural Philosophy.

W. N. GRIFFIN.

From the Rev. G. RAWLINSON, M.A., Examiner in Classics.

In replying to your request for information as to the results of the Classical Examinations which I have conducted under the Council of Military Education, I think it will be convenient to take separately the three cases of the examinations for Woolwich, those for admission to Sandhurst, and those for direct commissions. These three examinations differ in some respects from one another; and it may tend to clearness if their results are stated separately.

I. I shall begin with the Woolwich examinations. And here I must first express my regret that, on looking through my papers, I have been unable to find my private memoranda of the details in one or two cases. Out of ten examinations which I have conducted, I have the full details of eight; but I have only partial details of the other two. It is my belief, however, grounded partly upon recollection, partly upon the reports which I addressed on each occasion to the Council, that this incompleteness is unimportant; or, in other words, that, had I possessed the full details in every case, the results, which I shall proceed to state, would have undergone no serious modification.

I observe then, in the Woolwich examinations, from first to last, a gradual but very decided improvement. This improvement is not without fluctuations, some of which seem merely attributable to chance, while others are traceable to a sudden rise or fall in the number of the candidates. Since I have been examiner, the classical candidates have varied between the extremes of 49 and 86. Now, an increase in the number of candidates is almost always accompanied by a fall in the average of attainments.

To come to particulars, I find that in Latin the per-centage of failures has fallen from 30 per cent. in July 1859 to 12½ per cent. in January 1864—a diminution of 17½ per cent.; while the per-centage of failures in Greek has sunk from 65 per cent. in January 1860 to 30 per cent. in January of this year—a

diminution of 35 per cent. The improvement has been gradual and progressive; but it has been most marked recently. In Latin, the average of failures on my first five examinations (from July 1859 to July 1861) was 28 per cent.; on my last five (from January 1862 to January 1864) it is 19 per cent. The result, if I divide the examinations into three groups, is still more striking. In my first three examinations the failures averaged 28 per cent.; in my next four, 24 per cent.; in my last three, only 15 per cent. In Greek, there is less regularity. The failures in the first three examinations of which I possess records were at the rate of 48 per cent.; in the next three, at the rate of 47 per cent.; and in the last two, at the rate of only 31 per cent. This is reckoning the failures upon the number of candidates who presented themselves for the Greek paper. Substituting for this number that of the classical candidates generally, the failures in Greek will be, on the first three examinations, at the rate of 66 per cent.; on the next three, at the rate of 60 per cent.; and on the last two, at the rate of only 50 per cent.

While the per-centage of candidates who fall below the necessary minimum is thus diminishing, there is also some evidence of improved attainments among those who reach it. The number of candidates who obtained one-third of the assignable marks (double the minimum) for their Latin, was, from 1859 to 1862, on the average, 36 per cent. The number in 1863 and 1864 has averaged 51 per cent. In Greek, during the same periods, the numbers averaged respectively 13½ per cent. and 22½ per cent. This improvement does not, however, much affect the best candidates, who continue to obtain—in Latin, at any rate—about the same proportion (two thirds) of the assignable marks.

The improvement of which I have spoken is spread pretty generally over the different subjects. It is more perceptible, however, in Greek than in Latin, and in Greek Prose Composition than in any other head of examination. In January 1860, out of 49 classical candidates, 12 only tried Greek Prose, or 24 per cent.; and of these, three only obtained one-sixth of the marks, or 6 per cent. In January of the present year, out of 64 classical candidates, 28 attempted this subject, or 43 per cent.; and of these, 26 obtained one-sixth of the marks, or 40 per cent.

II. With respect to the candidates for admission to Sandhurst, my experience covers too short a space (three years) for me to feel that I can speak of the results of the examinations with entire confidence. Still I think I can trace here also a decided improvement, though not so great as that which I have shown in speaking of Woolwich.

The number of classical candidates has risen from 52 in December 1861 to 90 in December 1863. The proportion of those who take up Greek as well as Latin has increased from 25 to 41 per cent. in the same time. The failures have sensibly declined. In 1861 the failures to obtain the necessary minimum in Latin were at the rate of 34 per cent.; in 1863 they fell to 27 per cent. The grammar has especially improved. In 1861 the proportion of candidates who obtained one-sixth of the grammar marks was, in Latin, 65 per cent.; in Greek, 19 per cent. In 1863 the proportion had risen, in the one case, to 79, in the other, to 34 per cent. One-third of the grammar marks were gained in the former year by 27 per cent. of the candidates, for their Latin, and by 11 per cent. for their Greek. In the latter year, the proportions were respectively 41 and 25 per cent.

III. My experience as examiner for direct commissions covers a space of five years, in the course of which I have conducted 13 examinations. On tabulating the results I find a moderate improvement in *almost* every respect,—an improvement to a less extent than in the cases of Sandhurst and Woolwich, but still very clear and decided, and, what is very important, progressive.

The average number of classical candidates at the first six examinations out of my 13 was 82; at the last seven, it was 87; at the last three, 98. The proportion of the candidates who took up Greek was at the rate, respectively, of 23 per cent., 29 per cent., and 31 per cent. The rate of those who passed in Latin has varied very slightly during the entire period. On the first six examinations it averaged 65 per cent.; on the last seven, 62 per cent.; on the last three, 64 per cent. (Here, it will be observed, there is a slight fall). In Greek the rate of those who passed has risen considerably. On my first six

examinations it was 10 per cent.; on my last seven it was 17 per cent.; on my last three, it was 19 per cent.

The merit of the best papers has increased considerably. The average of the *highest* marks obtained was, on the first six examinations, for Latin, 1320; for Greek, 906. The average on the last seven examinations was, for Latin, 1492; for Greek, 924. The average on the last three was still higher, being, for Latin, 1568; for Greek, 1010.

Again, on the first six examinations, the proportion of candidates who obtained one-third of the assignable marks was, for Latin, 16 per cent.; for Greek, 4 per cent. On the last seven examinations the proportions were respectively 20 per cent. and nearly 6 per cent. On the last three examinations they were 26 per cent. and 7½ per cent.

The chief improvement has been in the grammar. One-sixth of the marks assigned to grammar were obtained, on my first six examinations, in Latin by 52 per cent. of the candidates; in Greek by 12 per cent. On my last seven examinations, the proportions were respectively 60 and 17 per cent.; on my last three they were 65 and 20 per cent.

One-third of the marks for Latin grammar were obtained, on the first six examinations, by 19 per cent.; on the last seven, by 25 per cent.; on the last three, by 32 per cent.

Half marks for the same subject were obtained, on the first six examinations, by 5 per cent.; on the last seven by nearly 8 per cent.; on the last three, by 13 per cent.

There was a similar improvement in the merit of the answers to the questions set in Greek grammar.

In conclusion, I will reply briefly and generally to the questions transmitted to me on behalf of the Council.

In reply to question 1, I think I may say that the present state of knowledge shown by the candidates is a considerable improvement on that shown by them at the first examinations held by me as examiner under the Council; that progress is indicated to a fairly satisfactory extent.

In answer to question 2, I have to observe that progress still continues to be made: that there is no indication of the maximum of attainment having been reached, but, on the contrary, that the rate of progress has been most rapid recently.

In answer to question 3, I should say that *at first* the great deficiency was in grammar and composition, but that recently these points have been much better attended to. It was also remarkable that so large a number of decent Latin scholars should have no knowledge at all, or no knowledge that was presentable, of Greek. Here, too, there has been much improvement of late years; but still the Greek scholarship lags greatly behind the Latin; and it is but seldom that a really valuable amount of knowledge is shown in the Greek papers.

In answer to question 4, I must observe that, in the great majority of those who obtain good marks, say, one-third of the maximum, the grounding appears to have received proper attention; nor are there any indications of hasty or superficial teaching. But a deplorable ignorance of grammar continues to be displayed, not only by those who fail to obtain the minimum of assignable marks, but also by many whose power of translating passages, which they have probably read, makes it necessary to assign them marks considerably exceeding the minimum.

GEORGE RAWLINSON, M.A.

From the Rev. OSBORNE GORDON, B.D., Examiner in Classics.

I have been carefully considering the different heads of inquiry suggested by the Council of Military Education, relating to the examinations of candidates for Direct Commissions, the Royal Military College, and the Royal Military Academy, as far as they come under my notice as one of the examiners in Classics.

Between the first two classes I can make no difference. The examinations are essentially the same, and the acquirements of the candidates seem to me to come as near as possible to the same standard. I must therefore speak of these two classes together.

1. I think their work on the whole indicates a gradual progress. This is probably due to the high value assigned to elementary knowledge of grammar, which is evident from the examination papers; I feel sure that this fact has to some extent secured greater attention to the subject, and I am not without hope that by persevering in the same course some further improvement may be attained.

2. I am not, however, sanguine of any very great improvement. Where there is no effective competition, and no great object to be attained by it, the tendency is rather towards the degradation of the standard; and the examiners are to a great extent in the power of the examinees. Men must be had for the service, and the examiners can only take the best and reject the worst. Many men take their measure from others whom they know to have passed. They have no wish to rise higher, and probably do not rise so high as their own ideal. The thirst for knowledge is not so strong in the human mind as is frequently assumed; and candidates for the army, as a class, have less than the average disposition towards intellectual labour. Against all this the system of examination has to contend.

3. The great defect that I note is still in the elementary knowledge of Greek and Latin grammar.

4. And the cause of this lies in the bad teaching of the schools. It is a great mistake to suppose that schools have improved in their teaching in this respect. From the experience I have had both in the University of Oxford and in connection with your department, I am convinced that it is much more negligent than it used to be. Many of the candidates, it is true, come from private tutors. It is difficult to estimate the value of their work there; if they learn anything, they must have known very little before, while if they forget, they must forget a great deal, on the supposition that they go there in a creditable state. The assistance of a private tutor may be necessary in other subjects than classics, which at present are hardly professed to be taught in public schools, but if men are obliged to come from public schools to private tutors to learn any part of what they know of classics, they certainly reflect very little credit on their teachers. A fair knowledge of elementary grammar, a fair translation of the easiest passages that can be picked out of the most familiar authors, and a few sentences of something like Latin prose, is certainly not more than might be expected from the upper classes of any public school.

The candidates for the Royal Military Academy are on the whole very superior to the others, and some of them occasionally exhibit as good scholarship as can be expected from youths who have to bring up other laborious subjects at the same time. The impression they make upon me generally is that their classics have grown a little rusty, and I am not surprised at this, when I look at the high standard of mathematics, that they have to attain. But if they were better taught, they would have a better hold on their knowledge, and if they had ever read Virgil or Horace, *e.g.*, well, it is impossible that they should come to them as if they had never seen them before. I have before noticed how badly Horace in particular is translated. In the last examination, I do not think there were more than half a dozen tolerable efforts, and some of the mistakes were so extraordinary and made by so many candidates, that I could not help inferring that they must have had the advantage of the same system of tuition, if not of the same tutor.

The Council, I think, acted wisely in dispensing with questions in literature, to which it was impossible to obtain any answer; and subsequently in History, the treatment of which was unsatisfactory and useless. It was clearly got up, not by reading any historian, or even any manual, but by oral cramming. Proper names were written, not as if they had been seen in print, but as if they had been picked up by the ear; and one name was frequently substituted for another, if it resembled it, either in the initial or the final syllable. It was impossible to read the papers without feeling that they were of no value

whatever, and it must have been as great a relief to the candidates as to the examiners when the subject was dispensed with. I think the other work has improved since, and I am hopeful of future improvement.

It may reasonably be expected that whatever changes may follow from the Report of the Public Schools Commission will act upon the examination for the various branches of the military service, and the experience of those who have hitherto conducted the examinations will perhaps be taken into account in estimating the present condition of public schools.

OSBORNE GORDON.

From G. W. DASENT, D.C.L., Examiner in English, History, and Geography.

In compliance with the request of the Council of Military Education, I beg leave to forward to you the following observations on the results of the examinations conducted by me in English and History for Direct Commissions, as well as of those for admission to the Royal Military College at Sandhurst and the Royal Military Academy at Woolwich.

In regard to the first point of inquiry suggested by your letter, it is scarcely possible to compare the ignorance shown by candidates in the earlier examinations with the information possessed by those who now present themselves. It is enough, on the one hand, to state the fact that the first candidates had no knowledge whatever either of the most elementary principles of English grammar or of the simplest historical data; while, on the other, it may be said that the present candidates in general possess some information on the subjects of examination. When it is remembered that in the first examinations for Woolwich Academy it was only with the greatest difficulty that the examiners in English and History could find twenty or thirty candidates who had obtained the minimum of marks, and thus avoid failure, and that now, on the contrary, with a far greater number of candidates, very few present themselves so badly prepared as not to obtain the minimum, while a large majority show a very respectable proficiency, it cannot be denied that the knowledge shown by candidates at present displays great progress. The case is the same, though the progress is less marked, with the candidates for Direct Commissions, and for the Royal Military College at Sandhurst. In these the contrast between the extremes of ignorance in the earlier and proficiency in the later examinations is less striking; first, because before they began, the attention of teachers had been already turned to the importance of special preparation in the subjects indicated; and secondly, because as a class the candidates who present themselves for direct commissions and for Sandhurst are neither so well prepared nor of such natural ability as those who present themselves for Woolwich. Still, allowing for this distinction, both the recent Sandhurst examinations and those for Direct Commissions show a satisfactory amount of progress as compared with earlier examinations.

In regard to the second point suggested, I am decidedly of opinion that the progress referred to has not only been maintained, but that it is increasing. When the start is made so low in the educational scale as zero, there is room for many degrees of progress before the maximum which the scale can register is reached. When we begin with utter ignorance, we must congratulate ourselves if after a few years we meet with respectable mediocrity in subjects of education so thoroughly ignored as English and History were a short time back. I content myself, therefore, with stating my belief that the information possessed by the candidates in these subjects has progressed just in the same proportion as attention has been paid to them in educational establishments; and as that attention is at present by no means so widely bestowed on them as it ought to be, and as it must be, I conclude that as a general rule the candidates will continue for some time at least to present themselves better prepared. It becomes daily more and more the interest of teachers to instruct their pupils in English and History, and therefore I anticipate that the candidates in these subjects will show more and more proficiency.

In regard to the relative proficiency displayed in each subject of examination, there can be no manner of doubt that the earlier exercises in History were less bad than those sent in in English. This may be explained by the fact that it

is easier to teach historical facts than grammatical rules. It seemed at first as if the teachers and the taught were alike ignorant of English grammar, and both sat down wringing their hands and could answer nothing. In History, on the other hand, they could string together and learn by heart a few dates and names. Latterly I have remarked that the English questions in the Direct Commission examination have been more fully answered than those in History. I explain this change by supposing, first, that the teachers have now taught themselves something of the grammar of their mother tongue; and, secondly, that the candidates in general take more pains in answering their English than their History questions, because English is an obligatory subject, while History is not.

In regard to the fourth point of inquiry suggested, it has been already in great part answered in what has been already said. I content myself, therefore, with stating my general opinion that the candidates are better grounded than used to be the case. There are a far greater number who show a respectable proficiency, and consequently I infer that a greater number have been better grounded. But, as under no system of education will it ever be possible, even if it were desirable, to make every boy a Solon, and as the candidates will continue to present themselves a mixed class, some with better and some worse natural abilities, every examination must be expected to display cases of hasty and superficial training. Such cases, however, will depend much more on the parent who persists in driving his son into an examination for which he is naturally unfit, than on the teacher who perhaps in a very limited time has done his best with such unpromising material.

I suppose I ought not to close these observations without a few words on that bugbear of the new system of education, the great Ogre "Cram." Taking it, however, in its very worst sense, that of stuffing a certain number of undigested facts into a boy's brain, it must even then be admitted that the boy into whose brain the facts can be got is likely to be better than the boy into whose head no power on earth can drive them. Just as a glass that will hold water is more useful than one that will not. But, in truth, many use the word "cram" as a convenient vehicle of abuse against all education. It is the bad name they give to the dog they wish to hang. With them "cram" merely means teaching facts or principles of any kind; with them it is any improvement or development of the mind which does not jump with their own special educational fancy, or run in their own pet groove. Of both these kinds of cram an examiner will meet many examples. Against the first he will be ever on his guard, though he will naturally give marks to the candidate who can answer his questions even with the help of "cram" rather than to him who can neither answer them by cram nor by any other way. The second kind of "cram" he will hail with delight, for he will see in it that progress towards an enlightened education which befits a man and a gentleman, and which, when we attain to it, will enable us really to boast that we are better than our fathers.

G. W. Dasent.

From W. Stebbing, Esq., M.A., Examiner in English, History, and Geography.

Examinations for Direct Commissons.

1. In the earlier examinations I found, the candidates possessed of more knowledge than I had anticipated. In the mere amount of information I think there has not been so much advance since then as I should have expected; but there is considerable improvement in method, especially in the answers to my questions on grammar. This is probably due quite as much to the teachers as the pupils; but I think also that more time than formerly is in fact given now by the candidates themselves to the subjects in which I examine.

2. I am not disposed to expect much further progress, but this only under the present circumstances of education.

3. The candidates generally display more information in History, and more power of thought and management of ideas in the English Language paper than formerly.

I collect from my notes, that, in History, the questions answered best have been those turning on genealogies and dates, and on the lives and characters of English sovereigns, and of some distinguished statesmen and ecclesiastics, such as Wolsey, Cranmer, Laud, and Cromwell, but others also relating to a few popularly known transactions at home, such as the events connected with the Wars of the Roses and the expeditions of the Pretenders, and, on one occasion, the causes of the English Reformation have seemed favourites with the candidates. Sometimes, but very rarely, points in Modern Continental History have been treated ably; for instance, a question as to the period when Spain was most powerful, and others asking for the names of the countries ruled by certain Sovereign Houses, and a comparison of the French with the English Revolutions. But, generally, I have found both meagreness and inaccuracy in the foreign history, ancient and modern, while, in British history, the answers are seldom respectable to questions referring to the acquisition of our dependencies and the affairs of Ireland, topics of trade and rebellions, lives of very recent personages, and even accounts of battles so celebrated as Agincourt, Flodden, Blenheim, and Trafalgar.

In English, the candidates have got most marks for their corrections of mistakes in different quoted sentences; but I have also generally been well satisfied with their answers to questions on the use of such signs as *italics, new paragraphs, hyphens, brackets, and inverted commas;* the explanation of various grammatical terms, as *idiom, obsolete, oblique;* the formation of irregular feminines and plurals; the names of the figures of speech in certain given passages; and the distinctions between words like *between* and *among, whose* and *of which, shall* and *will*, and so forth. On the other hand, they have answered very indifferently questions on the uses of moods and tenses, and on parsing, and questions in which they were asked to cite or compose examples of different rules in grammar, not to explain given instances of them. The spelling also in the answers is usually bad; but this may be due simply to hurry, as the writing from dictation is commonly accurate.

4. In the case of the majority even of those whose attainments are respectable, I have no doubt whatever that the knowledge displayed has been acquired superficially and hastily. Not merely the occurrence of gross blunders proves this, but also the very frequent signs that facts hard and abstruse, and facts easy and trite, have been got up indiscriminately, apparently, with equal facility, and also with equal inability to comprehend the difficulties or the triteness. Another bad feature in the candidates' work is the perpetual reappearance of prepared fragments of information, which it seems to be the great object of many of them to adapt, however rudely, to the questions before them. I endeavour so to frame my questions that no answer to an old one will, as it stands, serve as the answer to the new one; but as it is impossible, and, moreover, would be most unwise, if possible, to be ever resorting, for the sake of novelty, to fresh nooks and corners of history and grammar, more or less well-assorted morsels of obsolete answers in both these subjects are continually being offered.

The superficial nature of the preparation is the worse, as knowledge in subjects like these is hardly of any use at all unless so acquired as to become a permanent possession of the student. Mathematics, and even foreign languages are probably of greater benefit for the purposes of mental training: history and grammar, if, as I believe they are, of any utility, are so, mainly, because they can be turned to practical account; but superficial knowledge never can be thus employed.

Examinations for Admission to the Royal Military College.

1–2. My observations on the examinations for direct commissions apply only partially to the Sandhurst admission examinations. I have never remarked in these nearly so distinct an advance. The candidates began fairly originally; they answer fairly now. But though there has been no continuous improvement and progress, the results of the several examinations have been

by no means all alike. In June 1863 the answers were clearly above the average, especially in History; but then, in December 1863, only the old average was reached, so that the former advance was perhaps due merely to an accidental superiority in the individual candidates. The generally fair but monotonous quality of the work is opposed to the supposition of any continuous advance. Indeed, these are not subjects in which the schoolboy mind is likely to excel, although to have been well trained in them at this early period is a condition of excellence in them subsequently. I have remarked throughout, that, though there is greater evenness in the papers of these candidates, they are inferior to those of the candidates for direct commissions, at any rate, in quantity of information. The spelling is better than, I am sorry to say, it ordinarily is in the latter examinations; but the composition is less matured and fluent, the essays being often treated as briefly and unmethodically as though they were simple questions on grammar.

3. An analysis of the answers in History of the candidates for the Royal Military College shows that the best are to questions turning on dates; on the lives and characters of sovereigns, and of some few statesmen, such as the elder William Pitt, and on the causes of such personages' popularity or unpopularity; while the relations, whether of war or peace, maintained by England with other countries, not merely with independent states, like Holland, Spain, and Austria, but even with Scotland and our dependencies, and the exciting causes of intestine agitations, from the civil wars in the reign of Charles I. down to Catholic Emancipation and the Corn Laws in recent times, seem to have attracted but little attention. Very rarely indeed has a question in ancient or modern Continental History been well answered; the exceptions to this general rule are questions on the lives of a few very famous persons, such as Pericles and Hannibal in the former, and Peter the Great, Charles XII., and Maria Theresa in the latter.

In Grammar, the best answers appear to have been those to questions on the construction of sentences. Questions as to the formation of words, *e.g.* of feminines from masculines, and the like, as to the obligations of English to foreign languages, the practical differences between such terms as *shall* and *will*, &c., and, generally, as to any point the non-perception of which would imply a habit in the candidate of using the expression wrongly in actual practice, have always been handled with ability; while those questions have uniformly been unpopular in which the candidates have had to find the examples for themselves, *e.g.* questions asking for exceptions to rules of syntax and accidence, instances of defective verbs and substantives, the most common terminations of adverbs and adjectives, &c., and also questions, *e.g.*, on the use of the moods and tenses, and on parsing, which could not have been answered properly without regular study of some English grammar.

Examinations for Admission to the Royal Military Academy.

1–2. I discover a real superiority in the later ones among these examinations, as compared with the earlier; but this can scarcely be called progress, any more than the inferiority of that in July 1861 to that of January 1861 could have been fairly termed retrogression. In the first examination held at Chelsea, the candidates decidedly displayed but little knowledge. It may have been that the questions were too hard, or that the candidates were somewhat confused by certain rules confining them in the selection of questions to answer. Whatever the cause, I was disappointed by the results. No more knowledge was exhibited than, perhaps not so much as, at the other examinations. From the first, however, I observed a great superiority in neatness and method, this merit belonging to the candidates, not as individuals, but as a class, and arising, evidently, not from their attention to this study in particular, but from their studies generally. In January and July 1860 there was a clear advance upon the 1859 (*i.e.* the earliest) examination, the method being as good, and the knowledge shown being much greater; but the improvement culminated in January 1861; and this examination has furnished a standard never since fully attained. In the later examinations the superiority over that in 1859 has been constantly maintained; but there have been fluctuations in their relative merits.

3. I learn, from a careful analysis of the answers to my History questions in these examinations, that the best answers seemed to me at the time to have been returned to questions on genealogical details, the lives and characters of our monarchs, and of a few celebrated statesmen and ecclesiastics, accounts of famous wars, as the French wars waged by Edward III. and Henry V., and the causes of the results in various great battles, together with a few political topics, such as the character of the feudal system, the course of the English Reformation, and the relation to each other of the chief parties in Charles I.'s reign. On the other hand, the lines of ignorance are tolerably well defined. Generally, but little information is exhibited on political, constitutional, and social matters (such as the quarrels between King and Commons on privilege, the character of State prosecutions, the condition of the people at one period as contrasted with it at another), foreign wars and alliances, Scotch and Irish, and, still more, Colonial and Indian history, events since the death of Queen Anne, and particularly since the French Revolution, and even lives, when of recent great statesmen and commanders, with the single exception of the Duke of Wellington.

For the English Paper :—The essays sent up at these examinations are commonly better than those of the other classes of candidates. They show more fluency than those of the candidates for the Royal Military College, though not more than those of the candidates for direct commissions; and they evince decidedly more thoughtfulness and power of arrangement than those of either class. The less obvious the subject, I have usually found it both the more popular, and also the more often successfully treated. In the answers in Grammar, abundance of evidence is contained that now, at all events, and perhaps ever since the earliest examination, real preparation is made, though, as in the case of the other examinations, it consists, I fear, to a great degree, of study of our old papers. In this part of the paper, the classes of questions which are well and those which are ill answered cannot be discriminated so clearly as in the case of the History. Sometimes a question in English is answered well at one examination, and at another, one intrinsically the same, though expressed in different language, is answered very badly. But there are some general principles of division; thus, as might be expected, concise questions are dealt with far more satisfactorily than more general ones, and facts than reasons. The age of the candidates would account for this; but the principal cause is the hurried way in which even these candidates prepare for this part of the examination, and the want of recognized text-books. In particular, questions on etymology are usually well answered; but the very same candidates who can explain, by reference to Anglo-Saxon or Norman French, peculiarities in etymology, are unable to give an account, not merely of the meaning of technical grammatical terms (which would hardly of itself be of real importance), but even of the uses of the moods and tenses. On the other hand, some other classes of questions of a practical character are usually very well answered; for instance, the corrections of errors, and, in an inferior degree, the explanation of obsolete idioms, in given quotations from more or less well-known authors. Such answers are highly satisfactory, as evidencing the existence among the candidates of a practical understanding of English, and an English gentleman's instinct as to what good grammar is :—but they are not signs that there has been any special preparatory training, good or bad.

It is hardly as yet time to pronounce any opinion on the results in one portion of these examinations, viz. Geography. It has been a separate subject in three only of the examinations up to the present time. So far, the results have been unsatisfactory, the answers being generally very meagre and very full of errors. As, however, the answers on each of these occasions have been an advance upon their predecessors, something may still be hoped for in this direction; but I do not feel very sanguine as to the possibility (or even the advantage) of elevating Geography to a level with Languages, Mathematics, or History, though it is indispensable as subsidiary to the last of these subjects.

4. The habit of relying much on the study of old examination papers set at Chelsea, appears as general with these candidates as with those qualifying for direct commissions. I have observed a continual increase in the piece-work character of the answers. The symptoms of this were most numerous in July 1861 and January 1863; but it has been perceptible enough at other periods also. The hasty preparation too, by the aid of short manuals, is as obvious as in the Direct Commissions' examinations; but it is a subject of con-

gratulation that really any books at all are prepared. At all events, these candidates contrast favourably with those at the other examinations at Chelsea, in the comparatively few really bad papers or absurd blunders sent in, though even so about a third usually of the whole number of answers are almost utter failures.

General Remarks.

The general aspect of each of these three classes of examinations is very similar, as indeed the cited results in regard to the good and the bad answers clearly show. Not only are faults in the spelling of ordinary words scattered broadcast through the papers of the candidates for Woolwich Academy, equally with the rest, but the defects generally seem to arise, in the case of each, from the same source, and to be capable of partial or thorough cure by the same means. The main part of the improvement likely to arise from the simple fact of the institution of regular examinations has, I believe, already been secured. From about the year 1860 I observed a clear advance in the merit of the answers at the Direct Commissions' examinations, and from the beginning of 1861, though the improvement was more fitful, in the work of the candidates for the Royal Military Academy. This improvement has been, of course, visible chiefly in the papers of the higher class of candidates, the proportion of failures (for direct commissions and for the Royal Military College, about one-fifth, or one-sixth, in History, which is no longer an obligatory subject, and a twenty-fifth in English, which is still obligatory) remaining nearly the same throughout. Any further progress, whether among the candidates of superior abilities, or the lower strata, must not be expected very sanguinely, unless these subjects begin to be studied more systematically than at present at schools, in the highest as well as in the lowest forms. Hitherto they would seem to have been regarded as mere excrescences of a regular education, and to have been resigned into the hands of gentlemen who, however energetic and able, have too little time with their pupils to be able to resist the temptation of teaching them how, if possible, to circumvent, as it were, the questions. This is not a question of so many hours of preparation. I believe that even now sufficient time in the mass is devoted to elementary History and Grammar. The question is, how the candidates may become *habituated* to such subjects and studies. For this purpose a single hour a week for three or four years is worth treble the time compressed into a few months.

There are, I acknowledge, some practical difficulties in the way of regular study of these subjects at schools. At present we require too large a field to be traversed in History. Perhaps it might be thought unfair to classical schools to exclude Ancient History from the papers; but there is no such scruple to be pleaded for the Modern Continental History. It is our duty not to see that candidates for the army have a mass of confused notions on the whole circle of history, but to make sure that they are not disgracefully ignorant of that of their own country. As it is, the knowledge of foreign history which they do finally succeed in accumulating by the help of some jejune manual, is generally utterly worthless in itself, and, still worse, probably has consumed much of the time which is all too short even for British history. There ought to be no separate questions on it; whenever, and so far as British history is involved with it, something of it will have been learnt along with the latter as a matter of course, and it might to this extent, but to this extent only, form matter for questions.

A far greater practical difficulty is the want of recognized text-books. This applies, in some measure, even to History; but it is really an insuperable embarrassment in English. Both the topics and the terminology of English Grammar are still debatable ground. The perplexity is not merely how one text-book better than another is to be found,—the difficulty is in the vagueness of the subject itself. Obviously, this quality of the subject would make it hard to fix upon text-books; but at any rate the same property which makes it difficult for those conducting an examination to select text-books out of which to examine, makes it doubly difficult for the candidates to prepare for examination in such a subject without any text-books having been fixed. The vagueness of the subject, a difficulty which affects equally teachers and pupils,

cannot be got over by us; but, by the aid of suggestions from the head-masters of public schools and others, the other difficulty might be. Such a selection of text-books would be no fetter; they might be superseded as soon as better ones are found out or composed, as is the case with any text-book in use at a school. The arrangement would be beneficial to all classes of candidates, but particularly so to the candidates for the Royal Military College and the Royal Military Academy; and this, not on account of the superior abilities of these candidates, but because they are generally submitted to a more regular training; and, by the promulgation of special authors as the subjects of examination, that would become possible which at present is impossible, viz. the introduction of History and English Grammar as elements in a regular course of studies.

William Stebbing.

From M. Alphonse Esquiros, Examiner in French.

That the knowledge of the French language had been improved in England since I was appointed an examiner under the Council, is a fact placed to my eyes beyond any doubt, by the comparison which I may draw between what was before and what is now an examination in French.

I recollect the time when most of the papers exhibited a character of inferiority, which has been successively raised to a fair rate of attainment. Some of the most obvious deficiencies to which the Council have more than once called the attention of candidates have to a certain extent disappeared. There is more method in the answers, and more accuracy in the work.

However, this progress is not to be over-rated. Superior candidates—I mean those who obtain from 800 to 900 marks—have increased very little. It is the average which has been decidedly raised. The scale of marks is considered as the best mode of testing either the retrograde, stationary, or progressive state of instruction. At present, credits allotted to candidates run higher, on the whole, than they did formerly, but seldom exceed a certain point. The conclusion to be drawn from such a fact is, that there has been a step in advance, but this progress finds a limit either in the methods of education, the time devoted to that branch of study, or the difficulties inseparable from a thorough knowledge of the language.

I do not think the maximum of attainment has been reached under present circumstances. Each succeeding examination, I hope, will bring the merits of candidates towards a higher standard. However, it must not be left out of sight, that in the range of instruction for modern languages there is less distance between ignorance and mediocrity than between mediocrity and excellence. With some attention, and a good master, pupils may attain, after a relatively speaking short time, a fair amount of marks, but to go further becomes to them a matter of much greater difficulty. There is a sort of boundary, and to remove it would perhaps require a change in the general system of teaching. English schools, organized as they are, very seldom bring forth their pupils to a mature state of knowledge in French.

One of the greatest obstacles to the progress of modern languages has been in England for a long time an inveterate routine. French was taught as classical idioms of antiquity, Greek and Latin, are in the colleges. It is necessary to find a road out of common practice, if a further step in advance is to be taken. Modern languages have laws of their own, and they should be entirely free in the course of instruction from the fetters of a method not at all calculated for them. Two powerful agencies ought to be at work in learning French, the ear and the mind. It is by writing from dictation, by reading out aloud and translating ideas from their mother tongue to the foreign one, that pupils may acquire a quick sense of the language; most of these conditions are embodied to a great extent in the professor.

Proficiency in languages requires grammatical knowledge as a basis. I have more than once, in previous reports, alluded to the want of elementary instruction, which too often impairs the best abilities of candidates. It cannot be too much impressed upon the mind of youths that the learning of languages is fraught with pain and labour, above all at the beginning. Pupils should grasp

the nettles before plucking the flower. If not sufficiently grounded in grammar, they contract a lazy habit of skimming over the difficulties, which follows them throughout their course of studies. The question then arises, whether there is not some method to acquire the principles of modern languages in a reasonably short period, and without too much tediousness. I know excellent French grammars written for English students; but I am not aware that any of them could supply the direct influence of a teacher. As far as elements are concerned, there is a great deal in the selection of what is absolutely wanted, and what is only accessory. It demands a peculiar tact, and some experience. The professor should be for his pupils a living grammar. His lessons may transfer a sort of active and natural knowledge, which all the books could not impart in the same measure; he keeps attention alive to the subject; he awakes in the beginners an undeveloped power; he counteracts their tendencies to diffuseness, and identifies himself with the different classes of scholars and their wants. A great part of responsibility rests upon personal teaching, and to it may be attributed the progressive or stationary state of things in this branch of instruction. As English pupils seldom go to France to be educated there, France must come to them in the person of a competent tutor.

The parts of the public examinations in which improvement is more obvious are writing from dictation and translation of English into French. The former exercise was very little practised some years ago in the private schools, if I may judge by the results of the examinations held at that time. More exertion has been bestowed upon it since the Council has called attention to the subject, and I have little doubt that that circumstance has contributed to the advance of other branches of instruction in French. In respect to the translation of the mother tongue into the foreign language, it is the point to be aimed at, no doubt, by good scholars. The candidates who are unable to grapple firmly with the elementary rules of the art of writing, and have no command over a sufficient range of words, become soon overwhelmed by the great difficulty of the task. In neglecting the earlier stock of instruction and attempting at once to climb the superior branches, pupils do not gain in extent what they lose in depth.

The progress in French is not equally marked in the different kinds of examinations. The advancement proved more obvious, 1, in the examinations of candidates for admission to the Royal Military Academy, Woolwich; 2, in the examinations of candidates for admission to the Royal Military College, Sandhurst; 3, in the examinations of candidates for direct commissions.

Since I became one of the examiners a change has taken place in the examinations of candidates for admission to the Royal Military Academy; questions in geography, history, and literature have been suppressed; but the examination, formerly spread over a larger surface, has lost nothing for being concentrated to the language. The readings of some candidates, and their being more or less conversant with French authors, may be traced back through their composition and their answers to questions in grammar. The large increase of candidates has also produced a greater amount of creditable papers. Knowledge arises from competition.

The examinations for admission to the Royal Military College, Sandhurst, are generally attended by candidates of limited proficiency in French, but out of the average, which is after all tolerable, very meritorious exceptions spring up occasionally.

The examinations of candidates for direct commissions have some peculiarities. The papers differ widely from one another in value; they either fall very low or ascend very high in the scale of attainments. The best candidates have been in all probability brought up in France, or in English families where French is spoken. The others show a very imperfect state of preparation, enforced upon them hastily and superficially by a sort of artificial tuition in private and public schools. More time devoted to the subject would save them on more than one occasion the disadvantage of failure.

Whether there has been progress or not, and to what extent, during the period which follows the admission to the Royal Military Academy or to the Royal Military College, is the question to be ascertained by the final examinations. A better mental discipline, a greater uniformity of method, a stricter

attention given to the essential parts of the language,—such are the leading features reflected upon the work of students, after they have been under instruction at Woolwich or at Sandhurst. Is there, nevertheless, room for improvement? I have not the ambition to suggest something new; but it strikes me, that, although connected with the first, the last course of instruction could assume a more decidedly practical tone. After having proved a reasonable proficiency in grammar, and a general acquaintance with the language, gentlemen cadets should be expected to write letters in French upon warlike subjects, to learn military terms relative to their arm, and to show themselves conversant with the description of sieges and battles.

The advantages to be derived by an English officer from a knowledge of the French tongue are so obvious, that in dwelling upon them I would only repeat what has been so often said by the press, and echo the thousand voices of public opinion. The French language is spoken by all the refined world, and officers of the British army are expected to possess such an important part of a gentleman's education. France has produced books deserving to be looked at from a professional point of view; its literature is rich enough to repay for the trouble of learning it; and French campaigns have been celebrated by historians and field narrators, which may be consulted with great profit by military men. These advantages appear to have been fully understood by the great number of candidates who have constantly applied to be examined in that branch of instruction, though it was not an obligatory subject.

ALPHONSE ESQUIROS.

From M. SAVOYE, Examiner in French.

During the five years elapsed since I first had the honour to be called to the office of examiner in French under the Council of Military Education, I have conducted 39 of those examinations that are to be comprised in the present Report: 10 for admission to the Royal Military Academy, Woolwich; 3 at Woolwich, for gaining commissions; 5 for admission to the Royal Military College, Sandhurst; 7 at Sandhurst, for obtaining commissions; and 14 for direct commissions.

As a wholesale, general impression, I am happy to state that the present condition of the candidates' knowledge in French, as compared with that of former years, shows a manifest and unmistakable progress. This progress has been steadily advancing and increasing, extending by degrees over the whole area and the different branches of their studies; and, inasmuch as it is, in a considerable proportion, brought about by preparatory studies more carefully performed, it offers, from its very outset, a token of still better results and greater proficiency to be expected from future examinations.

The answers to *Grammatical Questions* and *Writing from Dictation*, strikingly deficient in so many cases at the beginning of the above-named period, evince, at the present moment, at once a better grounding and more practical exercise on the part of the students; *Translation from French into English*, a clearer comprehension and more facility; and a similarly growing facility obtains likewise with *Composition* (*Essays* in French and *Translation from English*), although not exactly in the same degree, which is only natural, considering the greater difficulty of the task.

With such already secured, and more and more spreading, improvements in preparatory schools, and in the methods of teaching, owing especially to the wise and practical admonitions put forward from time to time in this direction by the Council of Military Education in their periodical reports;—with a tuition by talented and zealous masters, such as are holding office at the Royal Military Academy and College, fostered and favoured by local and superior authorities, and combined of course, as an essential condition, with the encouragement of parents, and the students' own earnest valuation of and perseveringly keeping to their work, I have no doubt in affirming that young officers may and do enjoy not only a promising groundwork of learning, but also the sure means of an ever-increasing mental training, which leads to still

higher attainments, and warrants the practical and useful application of their knowledge to the requirements of their professional career.

I need scarcely enlarge on the observation that this general statement does not indiscriminately apply to all candidates, nor can it be said to be true in an equal degree of the various initiatory or final examinations. How far it may be subject to distinctions, to what extent it may have to be modified, according to the different sorts of tests and different circumstances, will best be seen by the following special appreciations.

1. Examinations for Admission to the Royal Military Academy, and Examinations at that Institution for obtaining Commissions.

What has just been said of a more cheerful aspect of the candidates' proficiency and their more creditable preparatory studies in general, applies above all, and in a prominent degree, to the examinations for admission to the Royal Military Academy.

What with the competitive nature of these examinations, the lately diminishing number of vacancies, the authoritative comments of the Council of Military Education, and the consequent necessity for greater exertions at the hands both of masters and pupils, it is a positive and undeniable fact that the candidates arrive now far better trained and initiated, both in theory and in practice, not only in grammar and translating from French into English, but also in composition and writing from dictation. Far from standing still or retrograding, this progress has been and is steadily and uninterruptedly going on, and I have every reason for believing in its continuation and duration.

As to the examinations for commissions at the Royal Military Academy itself, under existing circumstances—that is, with an improved state of the cadets' preparation, and the incessant and strenuous care bestowed upon them by their chiefs and masters—it is scarcely possible otherwise than that the students should keep up a proportionate progress in their attainments. Such was the general impression I received from the examinations I have conducted at Woolwich. If I am not more confident and emphatic in this regard, I hope the Council will kindly take in consideration that it only fell to my lot to attend a comparatively small number of these examinations, three in all, for five years; one in December 1859, the very first year of my tenure of office; a second in October 1860; and a third and last in December 1862, when, concurrent with due praise to a certain quantity of very fair papers, indeed, showing a palpable improvement, as compared with those of 1860, I had, however, to record it as my conviction, that, with a considerable number of cadets, more earnestness, and perseverance in their application and working, would infallibly have secured a greater proficiency, especially in composition and writing from dictation.

2. Examinations for Admission to the Royal Military College, and Examinations at that Institution for gaining Commissions.

Whilst at once premising the rather large interval which exists between the admission examinations for Woolwich and those for Sandhurst, both in theoretical and practical knowledge of the candidates, to the prejudice of those for Sandhurst, I am, however, enabled here likewise to mention a steady improvement, slower, no doubt, and not altogether equally satisfactory, but nevertheless real and certain. My impression as to these examinations was, in many cases, that the candidates were not sufficiently penetrated with the usefulness and necessity of their studies, and had, more or less, neglected to bestow upon them such care and persevering diligence, or else had not enjoyed such efficacious training and instruction, as would have secured a higher and more complete success. In giving thus my general impression, I wish it to be understood that I do so without prejudice to the acknowledgment, in a goodly number of instances, of a very fair qualification.

Concerning the examinations at the Royal Military College for obtaining commissions, at the same time that I feel obliged to confess my not being convinced that the progress of the cadets is everything which could be expected and hoped for, considering the facilities and sterling instruction proffered to them—whether as a consequence of external circumstances that circumscribe

their application, or the limited number of lessons they receive, or also, with many of them, as a consequence of that want of due appreciation of the utility and indispensable necessity of their studies I have spoken of under No. I with regard to the cadets at Woolwich—nevertheless, I am happy to recognize, withal, the fact of an uninterrupted improvement, the more valuable and encouraging as it has, particularly during the last two years, unfolded itself, with increasing strength and intensity, in the various branches of learning.

3. Examinations for Direct Commissions.

Still lower down in the scale of merit and proficiency we come to the examinations for direct commissions.

The great majority of them are far from satisfactory. Many a time I have been looking with astonishment, nay, with something like admiration, if I may use this expression, at the *pluck* with which our young champions rush to battle, only to be woefully worsted. Assuredly, if daring courage could do it, their success would brilliantly shine forth in the return of marks. Unfortunately, blissful ignorance, however valorous, cannot cope triumphantly with law regulations, nor with the requests of examiners—a dry, unpoetical race of men. They ask for a bit of grammatical rudiments; for a moderate knowledge of the verbs, the very first requisite of French lore; they would wish the candidates to be able to fairly understand, and render in fluent English, a few passages of French prose, neither long nor difficult; they apply for an attempt at composition, and a specimen of their writing from dictation, scarcely much over a hundred words or so. Well, with the exception now and then of some highly creditable but true minority cases, they are doomed to sore disappointment in their expectation. Translation from French is imperfect; knowledge of grammatical rules, to say the least of it, insufficient; at composition the candidates very frequently do not even so much as try their hand, and dictation proves a regular bewilderment to their ears!

How are we to account for such a state of things? Sometimes I have noticed, on the examination papers, mournful outpourings like the following: "*Never written from dictation in my life*"....."*Unable to catch the words*"... and so on. This leads me to a few concluding observations.

There is not the least doubt that many of these young gentlemen come forward without even an approximation to serious preparatory studies worthy of the name. Their learning and the so-called teaching they have received are equally faulty, irrational, the merest patchwork. No more than any other science can the science of language be gained without the necessary time, working, application, and perseverance. A great deal might certainly be done by logical, intelligent, and practical training. Modern languages, as *living beings*, so to say, should be treated as such. The nearer we come in the teaching and learning of them to the example and precepts of nature, and the dealing with our own native language, the surer we are of success. To oblige the student as soon as possible, and however scanty his vocabulary, to express himself, to ask and answer questions in French only, and to write from dictation, is by no means placing empirical *routine*, mere practice, above science and respectable theory. It is quite the reverse. It is the most powerful facilitating of good learning through the lively, incessant activity of one's own mental strength. It is possessing one's self with the rules by the impressive means of examples that imply a useful meaning and a practical sense, fit for instantaneous application to making one's self understood and understanding others. It is encouraging and rewarding the student's good will and industry by the close and immediately fruitful results of his endeavours placed before his eyes. In short, it is time saved, not wasted,—gain secured, not thrown back into an uncertain, disheartening future.

Perhaps—I am almost afraid of it—I am about venturing on delicate ground, *the exigencies of the service*, with which I must not interfere. I have no intention to do so indeed, and I am confident the Council will receive these observations with that kind forbearance they have invariably shown to me. My task is accomplished after having given a few hints about the way by which, in my opinion and according to my experience, greater proficiency of the candidates might be attained without more trouble. Let it once be known that a more thorough preparation is the only road that can possibly lead to

their success and qualification, and they themselves, as well as their parents and tutors, will not fail to find out and to use the best means to reach an end they all so eagerly wish for.

J. Savoye.

From Professor Max Müller, M.A., Examiner in German.

In answering the questions addressed to me as one of the examiners in German under the Council of Military Education, I find it necessary to make a distinction between the examinations for direct commissions and those for admission to the Royal Military Academy at Woolwich and the Royal Military College at Sandhurst.

In the examinations for direct commissions I cannot observe any improvement in the answers returned by the candidates. Among those who take up German there are always some who, from having lived abroad or owing to other exceptional circumstances, possess a creditable knowledge of the language. They are able, without difficulty, to translate from German and into German, and they have not unfrequently acquired a conversational command of the language. There are a few, but very few, who seem to have learnt German by dint of reading with a master: their knowledge, though less showy, is in reality far more creditable, and in order to reward this small class of candidates properly I have always set apart a large portion of the marks for grammatical questions. There are, lastly, not a few candidates at the examinations for direct commissions who are ignorant of the very elements of German, and who ought to know that they have no chance of gaining any marks in this subject.

But while the average acquirements of the candidates for direct commissions have remained, as far as I can judge, stationary, there has been a decided improvement among the candidates for admission to Sandhurst and Woolwich, particularly among the latter.

Here, too, it is easy to distinguish amongst the candidates those who have enjoyed exceptional advantages at home, those who have worked at German with a master or at school, and those who know nothing of the simplest elements of German grammar. But here the second class preponderates, and preponderates more with every year. Considering that German is one of the less important subjects in these examinations, the present state of preparation, as evinced by the candidates at the last examinations, may be considered as satisfactory.

It is very difficult to reply to the question with regard to the character of the answers at the final examinations at Sandhurst and Woolwich, as compared with those given in at the examinations for admission. It does not follow that those who are best in German are elected, and among those who are elected there are some who know little or nothing of German. If all are placed at college in the same class the instruction must needs be of a very elementary character, and cannot much benefit those who have already made some progress in German.

Owing to frequent changes in the German masters, and other circumstances, the results obtained at the final examinations at Sandhurst and Woolwich, but particularly at the former place, have not been quite what they ought to have been. Last year, however, an improvement was perceptible both at Sandhurst and Woolwich, and there is reason to hope that this may continue.

Having lately been examined before "the Public School Commissioners" on the study of Modern Languages, I beg leave to refer to my evidence as printed in their report.

Max Müller.

From the Rev. C. Schöll, Ph. Dr., Examiner in German.

I have the honour to present to you a general report on the examinations in German which I have conducted, under the Council of Military Education, for the last six years. In doing so I am gratified to say that the present state of knowledge shown by the candidates, as compared with the result of the first examinations, indicates a decided progress, and bears witness to the great usefulness of the system of examination.

On the other hand, I am not prepared to say that the maximum attainment to be expected has, as yet, been reached. It might be fairly expected that half

the numbers of candidates should obtain half the number of maximum marks and upwards, and that failures should form the exception. This, however, has not been the case except in the *Examinations for admission to the Royal Military Academy*, which invariably take the lead and leave the other examinations far behind. I find, in referring to my list of marks, that, on an average, 53 per cent. of the candidates for the Academy gained upwards of half the maximum marks (and out of these not less than 19 per cent. upwards of two-thirds of maximum marks), whilst only 4 per cent. were below the minimum. At the first examination for Woolwich (July 1860) only 36 per cent. obtained half the maximum marks; at the last (January 1864) as many as 58 per cent., thus showing a most gratifying progress.

The result of the examinations *for admission to the Royal Military College* has been less favourable, the average of those who obtained half the number of maximum marks and upwards being 26 per cent., the average of failures 29 per cent. But here likewise a marked progress is discernible, the last examination (June 1863) showing 30 per cent. instead of 26 per cent., and only 6 per cent. failures.

In regard to the examinations *for direct commissions* the corresponding figures are 36 per cent., and 18 per cent. failures.

The examinations for obtaining *commissions from the Royal Military Academy* proved in the beginning most unsatisfactory, the failures amounting in 1860 to 61 per cent., the satisfactory papers (those which gained upwards of half the maximum marks) to 12 per cent. But from June 1861 a gradual improvement can be traced, so that in June 1863 the failures were reduced to 30 per cent., and the satisfactory papers rose to 28 per cent.

In passing to the examinations for obtaining *commissions from the College at Sandhurst*, I have likewise to remark that the result has been most unsatisfactory, and this not only in the beginning, as at Woolwich, but up to December 1862, the average of satisfactory papers being for several years 14 per cent., and that of failures 30 per cent. At the last examination (Nov. 1863), however, I have found a considerable improvement, as 32 per cent. gained half the maximum marks and upwards, whilst only 7 per cent. failed in obtaining the minimum. But it is to be remarked that on this occasion the questions were mostly taken from the text-books used at Sandhurst, and thus the answers facilitated.

Having thus endeavoured to give an approximate estimate of the progress which is observable in these examinations (except those for direct commissions, where the result appears to vary, owing perhaps to the increasing number of candidates), I pass now to the question, *in what particular branches the candidates show usually a good or bad state of preparation.* Generally speaking, the translation into English is the best part of the papers given in, although there is frequently a good deal of guess-work, showing that the candidates have been used to translate before they were able to parse or to understand the construction of a sentence. The translation into German is, as might be expected, successfully attempted by a comparatively small number. But even those who find no difficulty in making out the meaning of a sentence, exhibit not unfrequently a sad want of correctness in spelling and of acquaintance with the elements of grammar. This deficiency is likewise apparent in the answers given to the grammatical questions. It is evident that the grounding has in too many instances been neglected, and a superficial knowledge got up for the occasion. On the other hand, it is encouraging to find that more care has lately been bestowed on the study of grammar than formerly, and that cramming appears gradually to give way to a sounder method of instruction. It cannot be impressed too strongly on the teachers as well as the students, that without laying a good foundation in grammar there can be no sure success at examinations, nor any safe progress in subsequent studies.

In respect to the *final examinations at Sandhurst and Woolwich*, it would, no doubt, be highly interesting and important to compare their result with the answers given in at the examinations for admission to those institutions, as not only the progress made by the students, but also the quality of the instruction they receive, might in this way be tested. This might easily be done if the examiners were furnished with a list, giving the index number as well as the marks of those students who at the examination for admission have been examined in German and continue their German studies at the

institution. But at present the examiner has no means to identify the candidates. The general result of the examinations for admission cannot be compared with that of the final examinations, as only a part of those who passed in German is received into those institutions, and some, it would seem, discontinue their German studies after entering, whilst the majority, to judge from the answers they give in, appear to have taken up German after their admission only. As for the quality of instruction, I have already alluded to the steady progress which for the last three years has been observable at Woolwich, a fact which leaves no doubt on the efficiency of the teachers. At Sandhurst, likewise, a considerable improvement has of late been perceptible. I am fully persuaded that students who, under the guidance of their masters, apply themselves diligently to the study of German, will succeed in laying a good foundation for an officer's future studies.

C. Schöll.

From Warington Smyth, Esq., M.A., F.R.S., Examiner in Natural Sciences.

I have the honour, in reply to your letter, to transmit for the Council of Military Education a few remarks on the general tendency of the examinations as regards the replies of candidates on the subject of the Natural Sciences.

Direct Commissions.—During the first two or three years a large proportion of the candidates came forward to make a few wild guesses at what they knew little or nothing of. Answers of this kind are now less frequent; and although the number of those who present themselves for these subjects is still very small, they appear generally to have attempted, at all events, to read up certain handbooks, and have acquired a little elementary information. Very few indeed, however, have given evidence of any useful amount of knowledge.

Sandhurst Examinations.—Since the appointment of a Geological Professor the majority of the cadets have acquitted themselves very fairly, and, notwithstanding the limited time at their disposal, many of them have evidently acquired such a grounding as may be very useful in their subsequent career. I think that a marked improvement in the average standard has been observable.

Woolwich Examinations.—I have been somewhat disappointed in the expectations which I had formed of the better class of papers to be looked for at Woolwich. Many of the cadets have, it is true, furnished very passable papers, but it is evident that, from the time necessarily occupied in their other avocations, few of them can be expected to have the industry to read standard books on these sciences, or the opportunity of paying practical attention to the subject.

Admissions to Sandhurst and Woolwich.—The answers of candidates generally betray the fact of curt text-books having been employed to enable them to "get up" suitable answers to given questions; and thus gross blunders are often to be seen side by side with tolerable replies. It is hardly to be expected, considering the youth of the candidates, that more than a small minority should be provided with a better kind of knowledge, and if the examiners avoid as far as possible the setting of stock questions, it must result that most of the papers will receive but a moderate number of the available marks.

I believe that a different tone would be imparted to the teaching, and a zest given to the studies of the cadets at the Military College and Academy, if it were possible to organize now and then an excursion to some place of geological interest, which should enable them to see practically the bearing of the subject. I am afraid that without some tangible expositions of this kind a large part of the cadets will always look upon the natural sciences as without that authority and that applicability to real life which can alone ensure due attention.

Warington W. Smyth.

From Dr. S. P. Woodward, F.G.S., Examiner in Natural Sciences.

May I request you to submit to the Council the following memoranda, in reply to the several inquiries I had the honour to receive?

1. With respect to any *visible improvement* in the attainments of the gentlemen examined in the "Natural Sciences," I have compared the average results

of my examinations, and find them confirm my previous belief in an advance of qualification.

The number of candidates for direct commissions and for admission to the Royal Military College who elect to be examined in Natural Sciences is very small, but has increased latterly. The temptation offered by the large number of marks at the disposal of the examiner, and the elementary character of the questions, might have attracted many more candidates; but the examiner has found it impossible to award more than a small proportion of the marks in any but cases of special proficiency.

The candidates for admission to the Royal Military Academy, though few, are always more numerous, and of a higher class; they frequently show considerable acquaintance with the Natural Sciences.

2. In this branch great improvement may still be expected. Hitherto, tutors in general have set their faces against the introduction of the Natural Sciences into the academic course, being themselves unacquainted with them. But the adoption of a degree "in Science" by the University of London, and the establishment of Natural History examinations in the older Universities, will remove this difficulty. Already there is evidence, in the very blunders made by candidates, of the particular text-books they have used in preparing for these examinations.

3. As a general rule the candidates are very deficient in a knowledge of recent Zoology and Botany, the foundation of one half of Geology. With Chemistry they are better acquainted, and this, together with their proficiency in Mathematics, enables them to answer more accurately any Mineralogical question involving an acquaintance with the exact sciences. Those candidates who are most expert in Mineralogy are, however, often least prepared in the sister subject.

4. The best instruction in the Natural Sciences is that with which *practice* goes hand in hand. A good "grounding" requires the free use of a laboratory and instruments, of a museum, and access to mines and quarries. But the professors have been obliged to trust much to theoretical teaching, leaving its practical application to future opportunities. The attempts at "cramming," shown by the papers of candidates, have been very feeble and unsuccessful.

5. The final examinations at Woolwich cannot be expected to exhibit any marked improvement on the initial, which are voluntary, and include supposed proficients only. The pressure of more strictly professional studies probably debars the cadets from bestowing much time and attention on the Natural Sciences, or from deriving all the benefit they might from the Museum at the Academy, the highly instructive pits and sections in the neighbourhood, and the teaching of an eminently practical Professor.

At Sandhurst the case is different, the Professor being resident, and the cadets having the opportunity of learning as much practical and theoretical Geology as their natural capacity, taste, and time may permit. The *means* of teaching at the Military College cannot fail to be constantly improving.

I will only further add my belief that the instruction in the Natural Sciences given at Woolwich and Sandhurst, both "in itself, and as a groundwork for an officer's future studies," is exceedingly important, especially to the scientific branch of the service; and that while Mineralogy, as an exact science, requires to be regularly taught, and admits of being made a mental discipline, whereas considerable progress in Geology may be made by private reading and by practice in the field, the latter has a greater professional value. It is also the subject most likely to become matter of personal interest, and the only one, perhaps, calculated to afford additional topics of conversation to officers in the army.

S. P. WOODWARD.

From F. A. ABEL, Esq., F.R.S., Examiner in Experimental Sciences.

In reply to your letter of the 12th instant, I have the honour, in compliance with the request of the Council of Military Education, to submit the following observations with reference to the general results of examinations conducted by me, under the Council, in Experimental Sciences.

As regards the present state of knowledge exhibited by candidates for direct commissions, for admission to the Royal Military College and the Royal

Military Academy, as compared with that shown at the examinations held by me when first these were instituted under the Council of Military Education, there is no question of the great and permanent progress, indicated by such a comparison, in the extent of information possessed by the candidates who compete successfully in Experimental Sciences. Moreover, the proportion of the candidates under examination in these subjects whose papers are of a creditable character has been much higher in the recent examinations than it was in the earlier ones.

In the examinations for admission to the Royal Military Academy there has always been, from the commencement, a small number of candidates whose replies to questions have demonstrated that those gentlemen possessed sound knowledge of, and a love for one, or more branches of the subject. But the number of papers of a fairly creditable character, which at first was very small, has gradually and steadily increased, until it has considerably outweighed the proportion of indifferent and worthless papers.

This progress in the results of the examinations commenced soon after these were at first instituted, and has continued steadily, even to the last examination held by me, though it has recently been of a less marked character.

The latter circumstance indicates that the system of preparation for these examinations is gradually attaining a condition which is much sounder and more generally beneficial to candidates than those practised in the first instance. A further proof of this is to be found in the much more generally correct nature of the replies to questions which are specially prepared for eliciting from the candidates their real knowledge of the nature of important laws and theories in Experimental Sciences, by furnishing problems for the application of these, instead of simply requiring a statement of those theories and laws, which could be given with sufficient correctness by any young men of retentive memories, without their necessarily understanding their own replies. It is evident, therefore, that the system of preparing candidates for examination in Experimental Sciences, simply by loading their memories with definitions and facts, the true meaning and nature of which remains obscure to them, has given place, to a considerable extent, to more legitimate and profitable courses of education in these subjects; but the results of even the last examinations, instituted by me, show that much still remains to be accomplished in the way of improving the preparatory education, before the generality of candidates can be expected to have acquired that knowledge which will not only enable them to acquit themselves creditably at examinations, but which will also be really of permanent benefit and assistance to them.

As a rule, the subjects of which the best general knowledge is displayed are certain branches of Physics, such as the elementary principles of electricity, magnetism, and of the radiation, conduction, &c., of heat; on the other hand, the knowledge exhibited of important subjects, such as electric induction and specific heat, is seldom correct and sound. It is especially in connection with such subjects, the true understanding of which requires more careful study, that the knowledge is generally limited to definitions which have been committed to memory to serve the purpose of the examination, and of which the true meaning remains obscure to the memoriser; so that he is unable to reply to practical questions, which put to the test any real knowledge possessed of such subjects. The general standard of replies to questions in chemical science is somewhat below that of the results of examination in Physics, a result which is probably due to the greater difficulty of acquiring real knowledge in this science, in the absence of practical instruction.

Between the last examination for admission to Sandhurst, held by me in June 1863, and the preceding one which I had undertaken, a year and a half had elapsed; the improvement manifested in the general state of knowledge of the candidates in that period was much more marked than it had been in the still earlier examinations.

The results of the last examination held by me (in August 1863) for direct commissions, when compared with the earlier examinations of this particular description, also demonstrated a satisfactory progress in the general extent and soundness of the knowledge of elementary principles of the Physical Sciences possessed by the candidates. The results of the more recent examinations for

direct commissions exhibit, among themselves, considerable fluctuations, but a comparison of those furnished by the examination specified above, with the number of candidates examined on that occasion, indicates a decided improvement in the general standard of qualification.

The important benefits derived by a large proportion of the successful candidates for the Royal Military Academy from the well-arranged and really useful training in different branches of elementary chemistry which they receive before passing their final examinations, is always demonstrated more or less satisfactorily by the results of those examinations. The system of Chemical instruction pursued at that institution has been made the subject of most careful consideration and frequent improvement by Mr. Bloxam; and I am of opinion that in its present condition it is extremely well calculated to afford the cadets opportunity of acquiring sound and practical, as well as theoretical, knowledge of chemistry, permanently useful to them, and affording excellent groundwork for their future studies as officers. The great disproportion which unquestionably exists between the amount of time devoted to chemical studies and the variety and magnitude of the subjects included in the course of instruction, is a serious though apparently an unavoidable obstacle to the receipt of anything like the full benefit, by the students, which the system of tuition at the Royal Military Academy might afford.

A very important step in promoting the advancement, in the knowledge of practical chemistry, of those cadets who take a real interest in the science, is that which has recently been taken of opening the laboratory for voluntary work at specified times, in the hours of relaxation. I consider that the voluntary devotion of time by cadets to experimental chemistry, under proper direction, cannot be too highly encouraged.

The results of such examinations of the cadets at the Royal Military College at Sandhurst as have been held by me, when compared with those furnished by the admission examinations, did not demonstrate a progress at all corresponding to that furnished by the Royal Military Academy examinations. This was ascribable mainly to the very diffuse character of the course of instruction in Experimental Sciences, as compared to the small amount of time allotted to the pursuit of this branch of study. At Woolwich, Chemistry and Experimental Physics are quite separate branches of study; but at Sandhurst they have been included in one limited course of instruction. It was not to be expected that the generality of cadets should benefit greatly by that arrangement, however successful the professor might be in his endeavours to select specially, and give a useful amount of instruction upon, the most important of the vast number of subjects included in the course.

There can be no question, therefore, regarding the judicious nature of the modification recently introduced in the system of instruction, whereby lectures on chemistry are almost entirely excluded from the course; the students being only instructed in those elementary principles of the science a knowledge of which is essential to the proper comprehension of some subjects in heat and electricity. There is at present a much greater probability that the students at the Royal Military College will become properly grounded in those branches of Physics of which some knowledge is now generally indispensable; and that they may permanently acquire sufficient information upon the most prominent and fundamental subjects in Experimental Sciences, to serve as good groundwork, in the event of their subsequently devoting more special attention to these subjects.

In conclusion, I may be permitted to observe, with reference to the general question of written examinations in Experimental Sciences, that they are likely to lead occasionally to erroneous conclusions, with regard to the comparative knowledge and abilities of individual candidates, because a better memory, or a greater facility of expressing ideas in writing, may unquestionably prove victorious over superior practical knowledge. At the same time, there is no doubt that questions in most branches of this subject may be prepared, of a nature to test correctly the comparative *soundness* of the information possessed by candidates; and I consider that the results of these examinations may be regarded with confidence, as furnishing generally correct indications of the comparative knowledge of those examined, and of the progress, or success, resulting from the pursuit of a particular system of instruction.

F. A. ABEL.

From Professor LIVEING, M.A., Examiner in Experimental Sciences.

In reply to your letter of the 12th instant, I beg to submit to the Council of Military Education the following remarks.

On a review of the whole series of examinations for admission to the Military Colleges and for direct commissions which I have conducted, taken collectively, I have no hesitation in saying that there has been a considerable progressive improvement in the knowledge of Experimental Science shown by the candidates. In the earlier examinations there were always many, sometimes a third of the whole number, whose instructors ought never to have allowed them to present themselves for examination in this subject. The answers in these cases were little more than guesses, often very wild ones, and showed that candidates had merely tried their chance of picking up a few marks without going through any systematic course of study. I have no doubt that this was very much the fault of the instructors, that candidates had books put into their hands which they merely read without seeing the experiments described, and therefore without having definite conceptions of the facts under discussion. Few, if any, have sufficient imagination to learn anything worth knowing in such a way. In the later examinations there has been a decided improvement in this respect; the answers have been more to the point, and there have been fewer cases of the queer jumble of ideas which used to be frequent; in fact, more pains have been taken in teaching these subjects, and this is specially manifest in the examinations for admission to Woolwich.

I think, however, that there is still room for considerable improvement, especially with respect to thoroughness and completeness in the answers, and I hope to see further progress as these subjects come to form part of the regular course in all our large schools. Nothing but a catechetical system of instruction will answer with boys, and if they have that in Experimental Science there is no reason why they should not be as familiar with all the simpler laws of natural phenomena as they are with the rules of Latin grammar. That boys are quite capable of this I am sure from experience of one or two schools where a systematic course of Experimental Science is adopted.

The branch of my subject in which I generally get least done is chemistry; I hardly know why this is, except it be that in books on these subjects heat and electricity usually come first. Elementary chemistry, such as enters into these examinations, is, I think, easier than electricity, and the apparatus, and so on, requisite for illustrating it experimentally, less expensive than that required for the other branches. I think, too, that the laws of heat and of chemistry are the most important to the candidates, when looked at as useful information without reference to education, as they are of most frequent application in ordinary circumstances.

There are generally some answers to which there is a difficulty in awarding marks, because they show some acquaintance with facts or phenomena, but are incomplete, and show that little or no thought has been bestowed on the leading principles, and these are most frequent in the examinations for direct commissions. I am inclined to attribute failure in some of these cases to a want of natural ability quite as much as to haste in getting up the subject. There is scarcely an examination in which there are not some answers sent up which are not replies to any questions set at that examination, but to some which had been set in former papers. These are probably answers got up as likely to be set, and if such a system were found successful it would go far to vitiate the examination as a test of education; but I do not think that anything like a respectable proportion of the whole marks can be gained in this way, though a lucky hit may now and then be made with one question. If there were reason to suppose it successful, there would be an easy remedy in an oral examination.

It is sometimes curious to trace the influence of particular text-books. I have sometimes found the same mistake recurring in the answers of a great many candidates, and traceable to a misunderstanding of a passage in a particular text-book, while a few, better instructed, have pointedly avoided the mistake. One would wish, though perhaps it is more than one can expect to realize, that the distinction between getting up a book and getting up the subject were more distinctly recognized. It is incidental to all examinations that a certain amount will be learnt to serve the occasion, which will not afterwards be

remembered, but as long as the fundamental principles are understood I am not disposed to undervalue what is thus learnt. It is true that it is soon in great measure forgotten, but it is only the details which are quite lost; general laws once grasped are not readily let go. Besides, the fact that a student is able to get up a great deal in a short time is a proof that he has a tolerable head and considerable power of concentration, and is therefore likely to get on afterwards; and as it is not so much knowledge as capacity for learning and mental training which it is the object of these entrance examinations to test, I doubt whether there is much room for complaint on the score that subjects are read merely for the examination.

In the examinations for admission to Sandhurst and for direct commissions I have endeavoured to give those who had learnt only a little, but that little thoroughly, full credit for what they know by setting a choice of questions, but limiting the number to be answered; and I have thought it worth consideration whether this principle might not be carried somewhat further, either by restricting the answers to two out of the three branches, or by requiring a certain minimum to be attained in some one branch instead of in the whole, as is the practice at present.

There is one matter connected with these examinations, though not specially with Experimental Science, to which I think it right to call attention, and that is the very indifferent English in which many of the answers are worded: the sentences so broken or ungrammatical that it is very difficult to make out what is intended. Mere errors in orthography I am not disposed to lay much stress upon, unless the sense of words is altered by the spelling; but when, as is the case, nearly half the candidates for direct commissions make no distinction between such words as "affect" and "effect," and nearly a third write in broken sentences, it is an indication of defective training. Language and thought are so intimately connected that nothing gives definiteness to the ideas so much as being obliged to express them clearly. Where boys at school are occupied with Latin and Greek they learn to express themselves by writing in those languages, and I think that in schools where there is a "modern department" attention ought to be given expressly to English composition. It is probable that a good many of the candidates who are deficient in this respect help to swell the number of those who fail to pass; but at any rate I am sure that the inability to write a tolerably perspicuous sentence is usually attended with a want of exactness in thought, and that they are in some degree connected in the way of cause and effect. No school ought to think such a matter beneath it.

With respect to the final examinations at Sandhurst and Woolwich, I do not feel justified in saying a great deal, as I have not hitherto examined more than once at Woolwich, and the present system at Sandhurst has not been long in work. I have noted, however, greater completeness and accuracy in the answers at these examinations than in those given at admission, and this is progress of a right kind.

At Sandhurst the answers are still somewhat boyish, but I think that those who enter the college with some previous knowledge of Experimental Science do mature that knowledge, and are able to turn it to better account than before. With those who have no previous acquaintance with the subject it is not possible to make much progress in the time, but I do not think that what these gain is to be despised. No kind of information is likely to be found more practically useful to an officer thrown on his own resources at a distant station than a knowledge of nature's laws, and the course of instruction given at Sandhurst is good as far as it goes, and affords a fair starting-point for future study in that direction. The time which can be devoted to it there does not admit of more than this.

At Woolwich the case is quite different, inasmuch as the course is much longer; there the progress ought to be, and is, greater, and I have no doubt that the information which young officers take with them from the Academy is generally, so far as physical science is concerned, of a useful character, even if they do not continue to pursue the same studies afterwards.

At both colleges it seems to me that great pains are taken with the instruction in Experimental Science.

G. D. LIVEING.

From Captain SCHAW, Royal Engineers, Examiner at the Military Colleges in Fortification.

In compliance with your letter of the 1st June, I have the honour to forward, for the information of the Council of Military Education, the following report on the results of the examinations of cadets at the Royal Military College, Sandhurst, and the Royal Military Academy, Woolwich, conducted by me for the Council.

Royal Military College, Sandhurst.—The subjects in which I have examined the cadets here have been, Fortification, Practical Geometry, and Artillery. The cadets have always evinced a fairly accurate knowledge of the details of field fortification and of the short course of permanent fortification included in the obligatory course; but of late the mode of conducting a siege, and the subject of defilade, appear to be better understood than they were formerly.

The questions proposed in the short course of Practical Geometry have generally been fairly answered. Of the subject of Artillery, the cadets have but a slight knowledge, as might be expected from their not having seen the practical working of the weapons they describe.

In the voluntary course the answering is frequently very good.

The chief defect in the present course of instruction in Fortification at the Royal Military College is a want of uniformity of teaching, due to the absence of a regular text-book. I would suggest also that the course should be so modified that no cadet should leave the college without having a general knowledge of the polygonal or German system of fortification, and of the principal changes which have become necessary in both offensive and defensive fortifications, owing to the increased power of rifled small-arms and artillery. This extension of the course would appear to be desirable, even should it be found necessary to reduce the number of plates drawn by the cadets.

Royal Military Academy, Woolwich.—The examinations conducted here have embraced two subjects, Fortification and Descriptive Geometry. In fortification the cadets have generally answered very well, showing that the majority had obtained a very accurate knowledge of the subjects taught them; but I have been led to remark from time to time on the limited extent of the course of fortification which until very recently a cadet passed through during his period of study at the Royal Military Academy.

I am glad, however, to see that this defect is being rectified, and that the course is being modified, so that every cadet will, on leaving the Academy, have studied all the principal systems of fortification which have been employed in modern times, including the polygonal system, and also the whole of the operations of a siege, with the principal modifications caused by the introduction of rifled ordnance, in addition to the course of Field Fortification, and of Field Works and Military Bridges.

In Descriptive Geometry the answering has never been so good as in Fortification, but there has been a decided improvement since the date of the first examinations which I conducted on this subject. The drawing has always been very neat and accurate; but the proportion of good solutions of the questions has not generally been so large as might reasonably be expected from a body of young men so carefully selected as the cadets of the Royal Military Academy.

I conceive that an improvement would result if only one system of geometrical representation were taught, viz., the contour system, in which planes are represented by their "scales." The mode of representing planes by their "horizontal and vertical traces" is perplexing to most minds, and is not practically employed in preparing designs for fortifications or in architectural or engineering drawings.

In conclusion, I take the opportunity of remarking, that the time allowed to the examiner in Fortification, both at Sandhurst and at Woolwich, has generally been so short that it is hardly possible to give that full consideration to the answers of the cadets which is necessary to apportion credits with perfect fairness. It requires on an average 2½ minutes to examine and credit a single answer. An ordinary Woolwich examination, of 50 cadets for two days, will therefore occupy the examiner at least 60 hours. And when it is considered that he has his ordinary duties to perform, in addition to the

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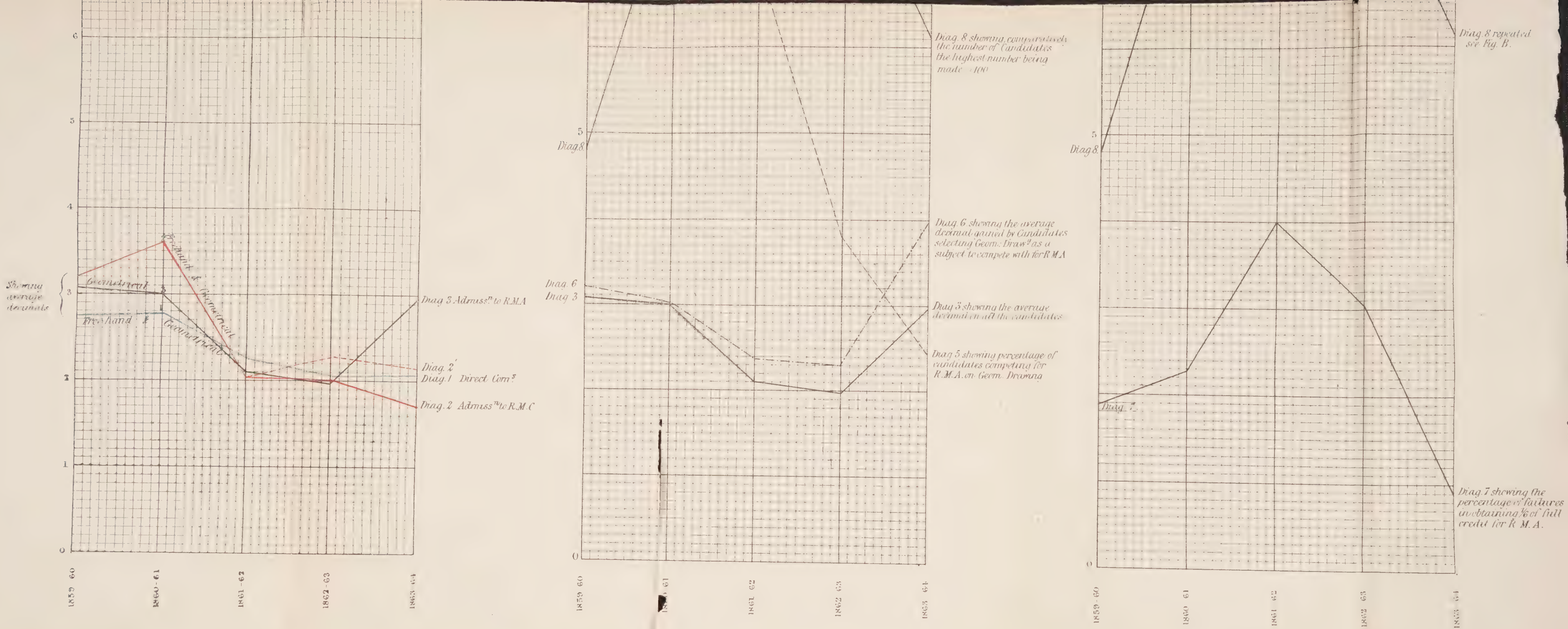
Showing average decimals
Geometrical
Practical & Geometrical
Practical & Geometrical
Diag. 3 Admiss.ns to R.M.A
Diag. 2'
Diag. 1 Direct Com.s
Diag. 2 Admiss.ns to R.M.C
Diag. 8 showing comparatively the number of Candidates the highest number being made =100
Diag. 8
Diag. 6
Diag. 3
Diag. 6 showing the average decimal gained by Candidates selecting Geom.c Draw.g as a subject to compete with for R.M.A
Diag. 3 showing the average decimal in all the Candidates
Diag. 5 showing percentage of candidates competing for R.M.A. on Geom. Drawing
Diag. 8
Diag. 8 repeated see Fig. B.
Diag. 7
Diag. 7 shewing the percentage of failures in obtaining ½ of full credit for R.M.A.
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1
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1859-60
1860-61
1861-62
1862-63
1863-64

examination, it will be evident that 10 days is not an excessive allowance for the preparation of the examination returns in such a case.

H. SCHAW.

From Major YOUNG, Royal Artillery, Examiner at the Royal Military Academy in Artillery.

In reply to your letter of the 1st June on the subject of the examinations on Artillery I have conducted at the Royal Military Academy during the last few years, I have the honour to state, for the information of the Council of Military Education, that, having looked over the results of the different examinations and given them my consideration, I find that my first examination and the one in December 1862 were about the best. On the latter occasion, the papers given in by the cadets were very complete, with a few exceptions.

I consider that the cadets are generally very fairly instructed in Artillery, quite as well as can be expected from the time allotted to this branch of study, or as is required for the ordinary duties they have to perform on joining the service. This remark alludes only to the subjects to which my examinations have been limited.

The cadets should be, and I presume are, fully instructed in the management and service of ordnance, heavy and light, including the practical use and mechanical principles involved in all military machines, and should carry on practice from the ordnance in general use in the service.

A few elementary lectures on veterinary art might, I think, be added with much advantage to the artillery course, if a suitable instructor could be found. Much want of this knowledge is felt by the junior officers of artillery on their being first attached to field brigades; and in consequence of this deficiency a young officer is frequently obliged to leave himself in the hands of an illiterate and inexperienced farrier, as regards the care and treatment of the horses in his charge.

CHARLES F. YOUNG.

From Lieut.-Colonel SCOTT, Royal Engineers, Examiner in Geometrical and Free-hand Drawing, and in Military Surveying.

In reply to your letter of the 2nd June last, directing me to furnish the Council of Military Education with a report of the examinations which I have conducted, in Geometrical and Landscape Drawing, of candidates for Direct Commissions, and for admission to the Royal Military College and Royal Military Academy; and also in Surveying, &c., of cadets competing for commissions from those establishments, I have the honour to submit to them the following observations, under the heads enumerated for my guidance.

With reference to candidates examined by me in Geometrical and Free-hand Drawing at Chelsea Hospital, the annexed diagrams will show the present standard of efficiency, as compared with that attained at the first examinations I held.

In diagram 1, 2, and 3, the abscissæ represent successive periods of 1, 2, 3, and 4 years from the date of commencement in 1859, reckoned from April to April, and the ordinates shew the mean average decimal gained per candidate in the examinations of each year; in Geometrical Drawing only, for the Royal Military Academy, and in Geometrical Drawing and Free-hand Drawing, taken together, for the Royal Military College and for Direct Commissions.

It will be seen that there is a general correspondence in the downward tendency of the diagrams thus obtained to the year 1862–63, after which the examinations for Direct Commissions show no important alteration, those for the Royal Military College a decided falling off, and those for the Royal Military Academy a decided improvement. Diag. 1, fig. A. " 2. " " 3. "

The diagrams resulting, however, from assuming as their ordinates the average decimal gained on all the examinations of the year taken together, need some explanations to enable a correct estimate to be formed from them of the changes which have occurred.

First, there was a very rapid improvement in Geometrical Drawing in the examinations for Direct Commissions between April 1859 and April 1860, which does not appear in diagram 1, as Geometrical and Free-hand Drawing are there taken together. This improvement is shown in diagram 4, where the abscissæ represent the number of months from the commencement at which the examinations took place, and the ordinates the average decimal gained in each examination.

See diag. 4, fig. D.

Secondly, an alteration made in the number of marks assigned to drawing for admission to the Royal Military College necessarily affected the average decimal gained in the years 1862–63 and 1863–64. By the old arrangement, the full number of marks allotted to drawing was 600, and a candidate received for excellence the full number of 600, whether the excellence was shown in Geometrical Drawing or in Free-hand Drawing; he was also allowed to attempt both, and if he did so he was rated on the full scale for that description of drawing in which he showed the greater proficiency, but (as is still done in the examinations for Direct Commissions) on a diminished scale for the second description of drawing sent in. By the present regulations for Sandhurst admission examination, 600 marks are assigned to Free-hand and 600 to Geometrical Drawing, and the average decimal has no longer the assistance which it had derived in the earlier examinations from the two subjects being taken together. Allowing for this alteration, and representing the line as it would have appeared had the old system continued, its position will be shown by the red dotted line. This, it will be perceived, approximates nearly to the diagram of the examinations for direct commissions.

See diag. 2, fig. A.

See diag. 1.

Thirdly, for entrance examinations for the Royal Military Academy, the subject Drawing is now considered by candidates in a much more unfavourable light than formerly. In 1859 candidates as a rule thought it prudent to count marks on it; now matters are reversed, and the great majority of the candidates take it up for qualification only. In 1859–60 the proportion of candidates who selected Geometrical Drawing as one of their five subjects was upwards of 90 per cent.; in 1863–64 it had fallen as low as 24 per cent. It is manifest that the present position and future prospects of this study cannot be justly estimated if this important change be lost sight of, for candidates who intend to qualify merely will not push on in a study so far, nor with such attention, as those who intend to count marks upon it. It is encouraging consequently to find that notwithstanding the very great diminution in the number of candidates choosing Geometrical Drawing as one of their subjects, the average decimal has so nearly returned to what is was in 1859–60 when those aiming only at a qualification in Geometrical Drawing were exceptional cases. Diagram 6 shows the successive alterations which have taken place in the proficiency of those amongst the candidates who have elected to count marks on drawing; and diagram 7 illustrates the per-centage of the candidates who have failed in obtaining one-sixth of the full credit given to the subject. It is to be remarked, however, that the improved decimal, diagram 6, in 1863-64, as compared with that in 1859–60, and also the improvement shown in diagram 7, in the decrease of failures, has arisen more from greater neatness of drawing than from better knowledge of the principles of Descriptive Geometry.

See diag. 5, fig. B.

See diag. 3, figs. A and B.

See diag. 6, fig. B.

See diag. 7, fig. C.

The low average decimal obtained in the Royal Military Academy admission competitions for 1861–62 and 1862–63, and the great number of failures in these years, may be in part, perhaps, attributed to the increased number of candidates who have presented themselves (many of them merely to try their strength) for examination. Diagram 8, showing how the numbers examined have varied, will assist in estimating the probable influences of such variation.

See diag. 8, figs. B and C.

To that portion of the 2nd question put by the Council, viz., "whether the maximum of attainment under the present circumstances of education appears to have been reached," the above diagrams, when considered in connection with the observations made on them, and the conditions under which the examinations for Direct Commissions have taken place, give, I think, a not unfavourable reply. In estimating the extent to which this question is affected by the decrease in the average decimal gained in the examinations for Direct Commissions, the influence which the Woolwich entrance examinations have had upon them must not be lost sight of. Many of the candidates who were unsuccessful in these competitions subsequently attended the examinations for Direct Commissions; and in the earlier examinations held by me the

greater number of such unsuccessful candidates had taken up drawing as one of the subjects on which they intended counting credits. At the present time the actual number of such unsuccessful candidates is not only reduced, but, as has been already shown, they take with them to the Direct Commission examination such knowledge and skill only as has been considered essential for reaching the qualifying minimum. This change of circumstances would fully account for the falling off in the Direct Commission Examinations.

See diag. 5, fig. B.

Diag. 1, fig. A.

It is not so easy to account for the comparatively high standard of preparation in drawing of the candidates for Sandhurst in the examinations of 1859–60 and 1860–61, since, whatever, the influence now, it does not appear probable that the Woolwich examinations at that time directly affected them; but it may be fairly supposed that, as a general rule, young men without much ability or application would prefer aiming at a direct commission to entering the Sandhurst College, and, if this be so, the extension of the number of students admitted to that college, and the corresponding diminution in the number permitted to enter the army by direct appointment, must necessarily affect unfavourably the general character of the Sandhurst entrance examination. I do not think, therefore, that much weight should be given to the lower average decimal for the more recent years gained by Sandhurst candidates, any more than to the decrease in proficiency in the Direct Commission candidates; and we must turn to the Woolwich entrance examination, to arrive at the means of fairly judging of the future prospects of drawing in the army.

Diag. 2, fig. A.

In that branch of drawing which in these examinations comes under my notice, viz., Geometrical Drawing, these prospects appear to me, as I have already said, not unfavourable, for notwithstanding the great decrease in the number of candidates taking up drawing as a subject, the average decimal is almost the same as at the time when drawing was regarded by candidates with most favour. I believe that the altered manner in which this study is now regarded by candidates has arisen from the feeling that only those who have a natural aptitude for Free-hand Drawing can hope to succeed with Drawing as a subject; and the fact that an increase in the qualifying minimum in Geometrical Drawing from 50 to 83 at once raised the average decimal almost in the same proportion, shows how easily an increase in skill in such drawing can be obtained.

See diag. 5, fig. B.
See diag. 3, figs. A and B.
Diag. 3, figs. A and B.

A consideration of the nature of the instruction at present given in schools in Geometrical Drawing also leads to the conclusion that the probable maximum of attainment has not yet been reached. Such instruction must evidently be, in general, of a very superficial character, or the extraordinary errors pervading the replies of a large proportion of the candidates which I have had, on more than one occasion, to bring to the notice of the Council, could not have been committed; but if it could be made evident to the candidates, that, as regards the *immediate object* of their desires, it would be to their interest to extend their studies beyond the mere mechanical solution of problems set at previous examinations, rapid progress would follow, and the study of Geometrical Drawing brings with it not only facility in representing to others what the mind has pictured, but some collateral advantages. The Rev. Canon Moseley has recently shown the use that can be made of Geometrical Drawing in the solution of mechanical problems by those who have but a limited acquaintance with Mathematics, and it is probable that those whose object it is to attain to a knowledge of the higher mathematics would often derive great assistance from the study. And such study need not be made or considered a speciality. If a boy on commencing his Euclid is made to draw his figures with neatness and accuracy, the mathematical teacher will soon find the solution of geometrical problems by rule and compass form an agreeable and instructive exercise for his pupil; attention will be directed in schools to the principles of those processes which are most conducive to accuracy in constructive problems; and many officers in the army who would otherwise enter upon their career without any real serviceable mathematical knowledge beyond the common rules of arithmetic, will have a sufficient acquaintance with elementary Practical Geometry to apply their knowledge in the field, and a sufficient familiarity with the nature of plans to use them with intelligence.

Without, however, looking to such contingent advantages in other branches of the service from an encouragement of this study, there can be no doubt

that of the two descriptions of drawing, free-hand and mechanical, the want of skill in the latter is that which would be most felt in the corps to which the Woolwich admission examinations form the first stepping-stone. I beg, therefore, to submit to the Council that it might be advisable to make success in Geometrical Drawing, in which almost all can attain to fair proficiency, independent of success in Free-hand Drawing, in which excellence can be reached by those only who have naturally the hand and eye of an artist.

I find it difficult to make a comparison between the results of examinations in drawing for admission to the Royal Military College and Royal Military Academy and those of the final examinations in these colleges in Surveying, but I am able to state that there is no sort of comparison between the knowledge of Geometrical Drawing shown by the generality of candidates for admission to the Royal Military Academy and that of the cadets who obtain commissions in the corps of Royal Engineers. As I have already shown, the knowledge generally evinced by the candidates at the former examinations is of a very superficial character, but of such as join the Royal Engineer establishment I think I may safely say that all have a sufficient acquaintance with Descriptive Geometry to practise placing work of fortification on contoured sites, and to commence any of the other studies which they are required to enter upon. At the final examinations at Sandhurst also, I find a large proportion of the cadets able to use their drawing instruments with sufficient skill to lay down the angles and distances as required in military sketching with some accuracy.

Looking, however, at the quality and usefulness of the instruction in Surveying at these two colleges, I should say that, so far as the examinations held by me enable me to form an opinion, while the skill shown at Sandhurst in military sketching is quite as great or greater than I should have been led to expect, there is to be discerned a want of appreciation of the skilful surveyor's constant adaptation of means to the end he has in view, in all their exercises. Since, however, this want is not now so apparent as in the earlier examinations held by me, I think it probable that some further slight modification of the present course may remove it altogether. At the Royal Military Academy, on the other hand, in those exercises in which accuracy has been insisted on, the general character of the work is as good as could be reasonably expected under the circumstances, but the knowledge shown by the cadets of the forms of ground, and their skill in representing them, is comparatively small. This does not arise from want of training in preparatory exercises, but is owing, as I think, to the entire disseverance from work in the field of the preparatory training of the hand, and to the difficulties opposed to field practice by the close occupation by private enclosures of the ground available for such practice in the neighbourhood of the Academy; perhaps, also, the defect is in some measure due to the course being made up of the independent ideas of several minds.

In some of my reports to the Council on the half-yearly examinations at Woolwich on the Theory of Surveying, as tested by written answers to printed questions, I have noticed the unthinking manner in which many of the cadets have received the instruction given them in this subject. They have learned by heart the words of the notes they have made, not only when these refer to principles, but even when they describe processes and instruments; and yet the principles, which it was the chief object of the instruction to convey to them are so simple, that no one of the cadets could have failed to grasp them with a far less amount of labour than he has expended in loading his memory with words to which he has attached no definite meaning.

See diag. 9, fig. D.

Diagram 9, however, shows very clearly that, so far as the examiner's marks can be regarded as a criterion of progress, the Council have reason to suppose that the degree of intelligence shown in the replies has considerably increased during the last four years.

Henry Scott,
Lieut.-Colonel Royal Engineers.

From the Rev. W. Kingsley, B.D., Examiner in Free-hand Drawing.

1. In the early examinations for admission to Woolwich the candidates laboured under a mistake with regard to their being at liberty to take up Free-hand Drawing as a subject, or not, and in consequence almost all of them sent

in drawings. These drawings were in general so bad as to prove that no pains had been taken to acquire a rudimentary knowledge of the subject; and in all my early reports to the Council of Military Education I had to draw attention to this fact; and it is only very recently that the candidates show that they have been under proper instruction. The last examination was a great advance upon all that preceded it, and indicated both better instruction on the part of the masters and more pains on the part of the pupils.

2. But there is still abundant room for improvement, and although the result of the last examination was satisfactory, as compared with those that preceded, it was clear that a very short time had been spent in learning to draw.

3. In all the early examinations it was rare to find candidates able to do anything more than copy carelessly some coarse pencil drawing of the Harding school. But they were quite unable to delineate any solid form, however simple, or in any way to draw accurately or judge of forms or proportions.

4. The candidates attempted in general to produce mere picturesque effects without having acquired any knowledge of the principles of light and shade, or practice of correct drawing either of copies or solid objects. The simplest mechanical processes were also in general unknown. I am glad to say that in the last examination almost all the candidates could copy with a fair amount of accuracy simple forms in outline, and knew the principles on which depend the delineation of solids, and had acquired a fair power of estimating proportions. But very few of them had learned to observe keenly or accurately the aspects of objects placed before them. The mechanical part of the subject was in a better condition than the intellectual.

5. It is clear from the foregoing remarks that until the last examination the grounding had not been attended to, excepting in a very few cases, and the object of the form of examination that has been adopted in this subject is to compel the candidates to learn the elements of correct drawing, which almost every person is able to do nearly as easily as he can learn to write. Every one who is to learn to draw, either for scientific or art purposes, must acquire the power of representing intelligibly simple forms; and with such power he is then fit for instruction in any special branch of drawing. 100 hours distributed over the course of a year are quite sufficient for any person of ordinary capacities to acquire this power of drawing correctly any simple form, and in general to be able to draw fairly. But as yet it is to be feared the candidates have not given nearly so much time to the subject, and have been in too great a hurry to run before they could walk.

6. In the Royal Military College at Sandhurst the time devoted to the subject is so short that nothing more than elementary instruction can be given; and the drawings executed before me during the examinations have in a large number of instances proved that the instruction given has been sound and good, and that it would only require time and application for these students to become good draughtsmen. Frequently the drawings from casts executed at these examinations have been remarkably good. It is very satisfactory to observe the entire absence of trying to get the candidates to produce any work for mere show.

At Woolwich the time of residence being longer, more advanced work is to be expected; but whilst no want of pains on the part of either teacher or cadets exists, there seems to be too strong a desire to encourage the copying of water-colour drawings. My own belief is, that nothing can be more detrimental to the study of drawing than this copying what are at best third-rate specimens of the art. Such work is not intellectual, and it produces in the student dullness of perception of the beauty of nature and of the higher works of art, and of all things tends most to induce inaccuracy. The best that can be said for such work is that it interests the student, and so some are led to draw in this corrupt way who afterwards correct their defects, but who would not have persevered in a more healthy and accurate course of study. This is not what ought to be the case in the Royal Military Academy. The cadets are necessarily of far more than average intellectual power, and there is no reason why the course of instruction should not be as accurate and severe as in the best schools of art. Observation and thought could easily be cultivated in such a class of students, and a very large amount of knowledge of the principles of art might be communicated during their course along with a fair

amount of practical skill: mechanical dexterity can only come through constant practice. The object of the instruction given ought to be the enabling the cadets to draw intelligently and intelligibly common forms, not the trying to make artists of them; for every one who has a strong natural feeling for art will be sure to express his feeling as soon as he has acquired the means of doing so; but it is a very small number of men who have the faculties required for an artist, whilst all persons of average mental and bodily conformation can acquire such a power of drawing as to be of use in almost every station of life, and which is almost indispensable to an officer who has either to observe or report upon ground or mechanical contrivances. The attempting to produce large, showy water-colour pictures is, I believe, entire waste of time. Good colouring is not to be learned in this way, for it cannot be produced by any one who cannot draw accurately and work well in sepia or monochrome of some sort. Perhaps no kind of drawing is so valuable to an officer as "pen and ink," and it would be well if the greater part of the time spent upon the water-colour drawings was given to learning to draw from nature with the pen. I must, however, add, that the work proposed to be taught is always fairly done, and at times work has been executed in the Academy worthy of any art school in the kingdom.

7. There is no subject in which it is so difficult to obtain assistance in the country as in drawing. The remuneration commonly given is so small, compared with the price of pictures, that no artist of eminence would give instruction on such terms. It is commonly the case that drawing masters are men who have failed as artists, and it is clear that the instruction given by persons of this stamp can be of little value. A man may not have imagination enough to become a painter, and yet have perceptive faculties acute enough to enable him to draw well what is before him, and he might be a very first-rate teacher; such men, however, are rare. It is undoubtedly of the first importance for young men preparing for the admission examination to acquire the first principles of correct drawing; in my reports upon that examination I have frequently had occasion to complain of the inaccuracy and mere showiness of the drawings produced. The time spent in learning to execute these bad drawings must have been sufficient to have enabled them to draw fairly, had it been properly spent in accurate study. And unless such a preparation is made, there must be a large waste of time when they come under the teaching of those who could give them advanced instruction.

W. Kingsley.

The foregoing Reports, taken as a whole, present a faithful picture of the past and present state of education of the several classes of candidates who come up for the army examinations. That they exhibit here and there some diversity of opinion, is no more than is to be expected. Different examiners will necessarily observe from different points of view. Not only will their particular views of education, as well as their greater or less severity of judgment, affect the general retrospect of their operations, but the accidental circumstances of the different examinations in which they have been engaged— the fluctuations constantly observable in the qualifications of successive batches of candidates—the adaptation, be it greater or less, of the questions to the actual instruction given in the schools—will all here come into play. The experience of one examiner cannot fail to be, within certain limits, different from the experience of another even in the same subject. Still, amidst all this diversity, there will be observed in the foregoing reports a very general consent as to the actual progress in education which has been achieved. Some subjects, as "English" and the Experimental Sciences, have risen almost from zero into subjects of education. That this has been accomplished without detriment to the more staple subjects of English education—Classics and Mathematics—is proved by the reports of the examiners in the latter subjects. In Classics a decided advance is noted, and, what is of great consequence

in respect to the effect of that study as an educational instrument, it is noted more particularly in the grammar and in composition. In Mathematics a still more marked progress is witnessed. The same appears to be the case in French. Again, it is not only in respect to the generally less advanced candidates—namely, those for direct commissions and for Sandhurst—that educational improvement is observed, but also, and that in a still more marked degree, in respect to the highly educated youths who present themselves for Woolwich. The testimony of the examiners is conclusive on this point. Thus there is good ground for believing that the great educational movement which the last few years have witnessed, has already begun to show valuable results in respect to the education of one large branch of the public service, that of the officers of the army. There is equal reason to hope that, with steady perseverance in the same path, with a careful watch kept on the part of the Council over the examinations, and above all by the continued employment, as examiners, of gentlemen of the highest reputation in the respective subjects of study, this progress will be maintained, and an important advance be made in the education of the country.

Before reporting upon the results of the examinations for admission to the Military Colleges of Woolwich and Sandhurst, and for direct commissions, it will be well to offer a few remarks in explanation of the examinations generally. The principle upon which they were originally established, and upon which all the modifications they have since received have been based, has been that of conformity to the general education of the country, except as regards mathematical knowledge, certain elements of which are required of every candidate. In respect to the examinations for admission to Sandhurst and for direct commissions, the mathematical requirements (Arithmetic, Algebra to Simple Equations, and three Books of Euclid) are precisely those which, in 1857, the head masters of the great public schools generally concurred in recommending for the army examinations. The following passages from the Report of the Royal Commission on Public Schools seem conclusive as to the moderation of this requirement :

" The scheme of Examinations for direct commissions, framed to meet the suggestions of the head masters of public schools, is simple and easy, and requires nothing that is beyond the reach of any boy of moderate industry and ordinary capacity; and it is clear that no boy, who will give himself a little trouble, needs to forego the wholesome influences of a great school for the sake of being 'crammed' in the house of a tutor. The Sandhurst examination also is evidently within reach of the schools." *

" In addition to the study of the Classics, and to religious teaching, every boy who passes through the school should receive instruction in Arithmetic and Mathematics, in one modern language at least, which should be either French or German, in some one branch at least of Natural Science, and in either Drawing or Music. Care should also be taken to ensure that the boys acquire a good general knowledge of Geography and of Ancient History, some acquaintance with Modern History, and a command of pure grammatical English.

" The ordinary arithmetical and mathematical course should include arithmetic, so taught as to make every boy thoroughly familiar with it, and the elements of Geometry, Algebra, and Plane Trigonometry. In the case of the more advanced students. it is desirable that the course should comprise also an introduction to Applied Mathematics, and especially to the elements of Mechanics."†

* Report of Public Schools Commission, vol. 1, p. 27.

† Report of Public Schools Commission, vol. 1, p. 53.

The acquirements last named, in addition to those in the former paragraph, would qualify a youth for competing at the examination for Woolwich. Those named as proper for the less advanced students would give him a high place, according to the present average amount of attainment, in the examinations for Sandhurst and for direct commissions. The Council have the greatest satisfaction in noting that the Royal Commission, after receiving evidence from the most distinguished masters, and the most eminent scientific men in this country, and after a long investigation into the nature of the education that is given, and a mature consideration of what ought to be given, at the public schools, should have arrived at a conclusion so entirely confirmatory of the principles upon which the army examinations have from the first been based.

Lest it might be thought that in the above remarks the Council have overstrained the meaning of the Royal Commissioners, they would add another extract from the same Report, which seems to remove all doubt of their actual intent :—

"The qualifying examination for Woolwich appears, before 1862, to have required an amount of mathematical knowledge difficult of attainment for a boy educated at a public school; but it underwent in that year some changes, which have made it easier for candidates who have not received a special training. The obligatory Mathematics do not now go beyond Plane Trigonometry. * * * This standard is certainly not so high as to be inaccessible to a boy educated at a good public school; and from a table showing the working of the scheme at the examination of January 1863, it appears that of the 20 successful competitors, 11 distinguished themselves in Classics; the other marks were chiefly gained in Mathematics and French."*

And again, at p. 38 of the same Report :—

"The chief of these are the examinations for Woolwich and Sandhurst, 'which mainly guide,' as we learn from Mr. Barry, the reading of the higher classes in the Modern Department at Cheltenham, and are to this department what the University course is to a high classical school. With regard to this first object, Mr. Bradley (Marlborough College) says 'there can be no doubt as to the result. Six candidates from our modern school have competed at Woolwich in the present year. All but one were successful at their first attempt, and scarcely one of them could have succeeded had he remained in the classical department.' But at the same time he adds that 'a good classical scholar would prefer to compete at Woolwich or elsewhere direct from the sixth form, joining, as in such cases he is permitted to do, the modern school in certain lessons only;' and Mr. Barry (Cheltenham College) is sure that at present 'boys could be sent in for Woolwich with almost equal advantage from either department of the college.'"

What is true of the Modern Departments of Cheltenham and of Marlborough College is no doubt true of very many excellent schools, of less importance as to numbers, whose success is noted in the published results of each half-yearly examination for Woolwich. It proves, if proof is required, that there ought to be no necessity for withdrawing a boy from a good school which will undertake to prepare him for the examinations. On this point indeed the statistics of the Woolwich Examinations afford valuable information. In the following Table are stated in the first column the numbers of successful candidates who have been educated at schools during the two years preceding their examination; in the second are the numbers of those who have been partly educated at schools and partly by private tutors during that period; and in the third are the numbers of those who have been reading wholly with private tutors.

* Report of Public Schools Commission, vol. 1, p. 27.

REFORM CLUB

Date of Examination.	At Schools.	Partly at Schools, partly at Private Tutors.	At Private Tutors.
July 1859	26	5	9
January 1860	25	18	21
July "	17	14	12
January 1861	29	28	25
July "	29	17	19
January 1862	13	24	8
July "	16	8	8
January 1863	8	8	4
July "	15	11	9
January 1864	17	10	6
July "	9	10	6
TOTAL	204	162	127

From this it appears that out of 100 successful candidates in the Woolwich Examinations :—

About 41 have been wholly educated at schools during the two previous years.

" 33 have been educated partly at schools, and partly by private tutors.

" 26 have been educated wholly by private tutors.

The "schools" included in the foregoing Table, are the Public Schools, Colleges such as those of Marlborough, Cheltenham, and Wellington ; grammar schools, and large proprietary or private schools. The public schools which were reported upon by the Royal Commissioners have not sent up, within the period embraced by the present Report, any successful candidate direct to the Woolwich Examinations.

Although so large a proportion as 33 per cent. of the successful candidates are withdrawn from their schools for the purpose of private tuition, the fact that 41 per cent. come up direct from schools, points clearly to the conclusion that the education which is required can be there obtained.

VIII.

EXAMINATION FOR ADMISSION TO THE ROYAL MILITARY ACADEMY, WOOLWICH.

Before the year 1855, admissions to the Royal Military Academy were obtained on the nomination of the Master-General of the Ordnance. Shortly after the transfer of the office of Master General to that of the Secretary of State for War, it appears to have been decided that admittance to the Academy should depend on the result of competitive examinations, which should be open to all comers who were of proper age, and who could produce satisfactory testimonials as to conduct.

The first examination on this system took place in August 1855. It was necessarily tentative in its character. It was conducted, under the authority of the Secretary of State for War, by the Rev. Canon Moseley, F.R.S., aided by a distinguished body of examiners. It was the first attempt, it is believed, to prove by public examination the actual state of the instruction given in public and private schools. The following was the result, so far as respects mathematical attainment :—

"Only 31 of 151 candidates afforded evidence of that degree of mathematical knowledge to which the designation 'moderate' was applied by the examiners, and which was ranked by them as one degree above 'imperfect' and three degrees below 'excellent.' The following may be taken as a type of this amount of mathematical knowledge: 1st, to work an easy sum in Arithmetic ;

2nd, to demonstrate a proposition in the First Book of Euclid; 3rd, to solve an easy problem in Simple Equations. It was not that precisely this knowledge was exhibited by every candidate whose exercise was marked 'moderate,' but that the knowledge so designated may be considered equivalent to it."

Expressed in numbers, the term "moderate," as used at that examination, indicated that the candidates had obtained at least one-third of the maximum of marks assigned to any subject. This affords the means of comparing, with tolerable accuracy, the attainments of the candidates of that day with those of the present day. By the Report of the Council on the Woolwich examination of July 1864, it appears that of 116 candidates, 94, or 80 per cent., obtained one third of the maximum of marks in the elements of Pure Mathematics to Trigonometry inclusive. As in 1855 less than 21 per cent., so far as it can be represented by marks, showed that degree of mathematical attainment, the gain has been no less than 59 per cent. It may be added that a "moderate" knowledge of Mathematics within the range just stated, means far more than the amount of acquirement stated by Canon Moseley to have been represented by that term in the examination of August 1855.

In Classics, the examiners of 1855 were very favourably impressed with the abilities and attainments of the candidates. From the marks actually awarded, it would, however, appear that this impression was conveyed rather by a fair number of good papers than by the attainments of the generality of the candidates. The probability of this supposition is increased by the circumstance that of the 171 candidates at that examination, 55, who were candidates for provisional commissions, were between the ages of 19 and 21; and of these, 20 came up from the Universities of Oxford, Cambridge, and Dublin. The return of marks shows that out of 129 candidates who took up Classics, only 33, or about 25 per cent., obtained above one-third of the maximum of marks. In the examination of July 1864, out of 56 candidates who took up this subject, 35, or about 62 per cent., gained upwards of one third of the maximum. On the other hand, the number of candidates in the former instance was 129 out of 171, or 75 per cent.; the number of candidates in the latter was 56 out of 116, or only 48 per cent. Although only two examinations, nine years apart from each other, have here been taken, it is believed that these results indicate very faithfully the process that has been in operation in the interim. The number of candidates who pursue their classical studies beyond the earlier schoolboy stage has been sensibly reduced. On the other hand, the attainments of those who continue those studies show that nothing has been really lost that was worth preserving. There can be no doubt that in the 27 per cent. of candidates who have abandoned their classics is represented that large class of minds which show no aptitude for languages, especially the ancient languages, and to which, therefore, the substitution of some more congenial study would seem to be an advantage.

It is unnecessary to pursue this comparison further. It is certain that there has been a marked change in the education of the candidates for Woolwich, and that this change has taken the direction of increased and improved mathematical study. If it has affected the classical studies of the schools only in the way of weeding out from those studies the candidates whose capacities were ill adapted to them, and of directing those candidates to other studies which they could pursue with greater profit to themselves: this may fairly be claimed as a solid advantage which has already been gained by the competitive system, and which there is reason to believe has not yet attained its full development.

The above contrast between the examinations held nine years ago and those held at the present day is the more useful in this place as the reports of the Council's examiners already given extend only as far back as the year 1859, when the examinations in question were entrusted to the Council, and when a great advance had already been made in the preparation of the candidates.

The early examinations having been, as before observed, necessarily tentative in their character, very few restrictions were at first placed on the work to be produced by the candidates. They were allowed to take up as many of the subjects of examination as they pleased. The temptation to do so was no doubt great. It arose at once out of the system of representing merit by numbers or "marks," a system, notwithstanding, good in itself, and one for which it would be hard to find an efficient substitute. The candidates soon found that it was easier to make up a respectable aggregate of marks by moderate attainment in many subjects than by higher attainment in a few. In nearly all subjects a low degree of knowledge is easily reached; it is then that their real difficulty begins, and that the capacity of the student is tried. The result was thus reported by the Rev. Canon Moseley in September 1856, after the third examination held on the competitive system:—

"In my last report I expressed to your lordship a hope that the tendency to diffusive reading, of which the first examination afforded the evidence, had been checked. I regret that this hope has been disappointed. * * * The candidates are reading more diffusely than ever.

"No less than 18 per cent. claimed each to be examined in eight different subjects, 19 per cent. in seven, and 21 per cent. in six. Reading spread over so large a surface cannot but be, for the most part, without depth; nor is the mind likely to be well disciplined which, passing from subject to subject, gathers up fragments from each, but encounters the real difficulties of none."

The measures taken to remedy this evil were the reduction of the number of subjects to be taken up by any candidate to five, and the requirement of a certain minimum of marks to be obtained in any subject before they should be allowed to count towards the aggregate.

In 1858 it was decided that the examinations for admission to Woolwich should be conducted by the Council of Military Education. As it was undesirable, however, to make any alteration in the mode of examination without giving sufficient notice to the candidates, the Council requested the Rev. Canon Moseley, who had then been placed on their board, to conduct the examination of January 1859 on the same plan as that adopted at previous examinations. The first examination, therefore, that was held under the superintendence of the Council was that of July 1859. Up to that date the scheme of the examination was as follows:—

	Marks.
1. Mathematics { Pure, 2,000 / Mixed, 1,500 } - - - -	3,500
2. English Language, Literature, Composition, History, and Geography - - - - - -	1,250
3. Classics { Language, Literature, Geography, and History of Ancient Rome, 1,000 - - - / Ditto ditto Greece, 750 - }	1,750
4. Language, Literature, Geography, and History of France	1,000
5. Ditto ditto ditto Germany	750

The examination in French and German being both written and *viva voce*.

	Marks.
6. Experimental Sciences, *i.e.*, Chemistry, Heat, Electricity, including Magnetism	1,000
7. Natural Sciences, *i.e.*, Mineralogy and Geology	750
8. Drawing, *i.e.*, Elementary Geometrical Drawing, including the use of drawing instruments, and either Machinery, Architectural, or Landscape Drawing	1,000

No candidate was allowed to be examined in more than five subjects, of which one was to be Mathematics: 700 marks were required to be obtained in Pure, and 300 in Mixed Mathematics. In all other subjects one-sixth of the maximum of marks allotted were required to be obtained in order that the subject should count towards the aggregate which determines the candidate's place in the competition. The candidate was further required to satisfy the examiners that he had a sufficient elementary knowledge of French and of Geometrical Drawing to enable him to perfect himself in both during his residence at the Academy. No candidate was to be considered as qualified who did not obtain an aggregate of at least 2,500 marks.

The Council considered it desirable to recommend some alterations in the above scheme, which were sanctioned. Greek was placed on an equality with Latin, each counting for 1,000 marks. The Language, History, and Literature of Germany were raised 250 marks, and placed on an equality with the Language, History, and Literature of France, each subject counting 1,000 marks. The Natural Sciences were raised from 750 to 1,000 marks, being thus placed an an equality with Experimental Sciences. Hindustani was admitted among the modern languages at 1,000 marks.

The minimum age of admission was lowered from 17 to 16, the higher limit of 20 years being still retained.

In January 1860, further important alterations were made in the scheme of examination. The obligatory minimum of 300 marks in Mixed Mathematics, which had hitherto been required, was often found to act injuriously in encouraging the candidates to read above their capacities, whilst in reality the essential requisite was a thorough groundwork in Pure Mathematics. Sometimes, also, this restriction threw out a candidate otherwise well qualified. It was therefore removed; but the candidate was still obliged to obtain 1,000 marks at least on the whole of his mathematical papers, and of these at least 700 in Pure Mathematics.

It was further ruled that, instead of the undefined test formerly exacted of "satisfying the examiners" in French, every candidate should be required to obtain at least 100 marks in either the French or the German language.

The results of former examinations in the History and Geography of Rome, Greece, England, France, and Germany, when those subjects were amalgamated with the respective languages, having been found extremely unsatisfactory, the Council recommended the following arrangement, so far as respects "Classics" and "English":—

			Marks.	
Classics	Latin	Language and Literature	1,000	1,500
		Geography and History of Ancient Rome	500	
	Greek	Language and Literature	1,000	1,500
		Geography and History of Ancient Greece	500	
English		Language, Literature, and Composition	1,000	2,000
		History and Geography of England and its Dependencies	1,000	

And with respect to French and German, they recommended that History and Geography should cease to be included among the subjects of examination.

In the Examination of January 1861, the History of India was introduced into the programme of the examination, forming, in conjunction with the Hindustani language, one of the five subjects in which a candidate might elect to be examined; thus :—

	Marks.
Hindustani Language - - -	1,000
History of India - - - -	1,000,

the candidate being allowed to reckon all his marks above the minimum of one sixth, in either of these or in both.

The system which has just been described continued in force for three examinations, viz. those of January and July 1860, and of January 1861. The experience thus gained enabled the Council to suggest some important alterations, which were carried out in the examination of July 1861. The first of these had respect to the position occupied by the Differential and Integral Calculus in the scheme of the examination, which only admitted of one, or at the most two, questions on these higher branches, in the Pure Mathematical Papers. This, as one of the examiners justly observed, was either doing "too "much or too little: too much, as tempting undue speculation on the "subject; and too little for affording a sufficient test of the candidate's "real knowledge." The Council therefore recommended, that 500 marks should be allotted to this subject, and this having received the sanction of His Royal Highness the Field Marshal Commanding in Chief and of the Secretary of State for War, they requested the examiners to set each a separate paper on the Calculus.

In each of the succeeding examinations, up to that of January 1863, the examiners reported improved results arising from this measure; but the evil still continued of the candidates unduly pressing forward before their groundwork was thoroughly established. In January 1862, the Rev. Canon Heaviside, one of the Examiners in Mathematics, writes :— "It is still my opinion that sufficient attention "is not bestowed on the more elementary subjects before the candi- "dates are pressed on beyond their depth. It is true that this evil "has been much lessened since I first had the honour to examine; but "even now it extensively exists, and it cannot be too strongly "impressed on the candidates and their tutors that they imperil "success by too ambitious or too speculative a course of reading." And in the same month, Mr. Todhunter, the other examiner in Mathematics, writes :—"The failure of those who have been unsuc- "cessful may be traced principally to an insufficient acquaintance "with the elementary parts of Pure Mathematics." These facts led the Council to propose further changes in the scheme of the mathematical examination, which will be hereafter described.

At the same time that the change above explained was made in regard to the examination in the Differential and Integral Calculus, one of not less importance was effected in regard to that in the Ancient and Modern Languages. At the first establishment of these examinations, a language, whether ancient or modern, comprised also, for the purposes of the examination, the literature, history, and geography of the country. It has been shown, that it was considered desirable in 1861 to discontinue the Histories of France and Germany as subjects of examination, and to give greater prominence to those of Greece, Rome, and England, by attaching them as separate sections to the languages, and further encouraging their study by means of the separate marks

allotted to them. It now appeared equally desirable to consider whether questions in the literature belonging to the several languages were suitable to the ages of those examined, and to the circumstances of their education. When the examinations were first established, the higher limit of age was 21. It was now 20, and every consideration in respect to the future career of the candidates as Artillery and Engineer Officers pointed to the desirableness of admitting them to the Academy rather at the lower limits of age, 16 or 17, than at the higher limits. It was not, therefore, advisable to set questions which would require an extended course of reading, ranging over a large number of authors. It was evidently better to ensure that the languages themselves should be studied deeply, than that the student should be carried cursorily over a wide field of reading, which could make no lasting impression on his mind. Indeed, the impossibility of really effecting this led to the want being met by a variety of short manuals, designed rather to enable the student to answer a few questions than to obtain any sound knowledge of his subject. A further reason was, that the number of the subjects which the candidate might take up (of which more will be said hereafter) was still so great that it was to the highest degree desirable to prescribe practicable limits to each one. The Council, upon these grounds, conjoined with the fact that the performances of the candidates in such subjects were almost universally unsatisfactory, recommended the discontinuance of questions in the literature of the several languages which entered into the examination.

The scheme as thus modified continued in force during the examinations of 1862. The abandonment of "Literature" as a subject attached to the several languages proved beyond question a step in the right direction. In Greek, especially, one of the examiners attributed the decided improvement which he observed in the papers "in " a good measure to the change in the examination whereby gramma- " tical and critical questions were substituted for those on Greek and " Roman Literature."

It was evident, however, that more remained to be done. It has been shown that at successive stages in the history of these examinations their limits have been gradually narrowed. This has arisen not only from the comparatively lower age of the candidates, but also from the altered circumstances of education. A new School Literature had arisen, designed expressly to meet the requirements of the public examinations. Formerly the knowledge of Classical or Modern Literature and History, when acquired at all, was acquired as a natural adjunct to the study of the Classical or Modern Languages. It was, doubtless, a rare accomplishment, but where it existed it had ordinarily been attained in a sound and natural course of study. It is probable that under the new system as many students read their history in this way as under the old, but it was painfully evident that this was not the case with the great majority. Mr. Rawlinson reported :—

" It is evident to me that candidates generally obtain their historical knowledge neither from the original writers, nor from English authors of good repute, such as Arnold and Liddell, but learn it either *vivâ voce* from 'crammers,' or from poor and meagre compendiums. Ludicrous mistakes in the spelling of Roman names indicate that many have only learnt their history *vivâ voce*. On the other hand, a fair number of the candidates have done decidedly well."

And, to the same purport, Mr. Gordon reported :—

" There are a great many failures in History, and the Council may easily satisfy itself as to the way in which that subject is treated, by looking at any

of the papers. Many of the candidates, it is clear, simply get up a few questions by rote, and write down what they remember of them, without the slightest reference to the questions given. Thus, in answer to a question about *Sosicles*, a man writes a long account of Socrates, which he had clearly committed to memory, with the intention of bringing it in anyhow. Another gives an account of Lysander instead of Peisander, and a third of Pausanias. No person who had the least knowledge of Greek history could make such mistakes, and I cannot assign any value to such mere evidence of cramming."

It appeared to the Council that the time had now arrived for further revising the scheme of examination, with a view to adapt it more completely to the actual circumstances of education, to encourage sound instruction, and to offer every practicable bar to those illegitimate modes of teaching, which, it was evident, were still being largely resorted to. This was the more necessary as the higher limit of age at which candidates could enter the Royal Military Academy had been reduced since the examination of July 1861 from 20 to 19, the lower limit of 16 being still retained. The examination itself must of course be governed principally by the higher limit of age; and the reduction in this by one year, and that the year at which young men usually enter the universities, could not but influence the nature of the requirements.

The matter that most urgently called for revision was the number of subjects the candidates were allowed to bring up for examination. This was nominally five; but as the Roman, Greek, English, and Indian histories were respectively attached to the languages, with high marks allotted to them, each of these languages became virtually a double subject; and the candidate who took up, for instance, Mathematics, Classics, English, Hindustani, and Drawing, would in reality take up Mathematics, Latin, Roman History, Greek, Greek History, English, English History, Hindustani, Indian History, and Drawing, both free-hand and geometrical; he would therefore take up ten subjects. This appeared to the Council to require immediate and effectual remedy. In recommending the course to be pursued, they could not but bear in mind the representations which had been made to them by the examiners of the extremely inefficient and, in fact, useless manner (except for chance credits at an examination) in which Roman, Greek, and Indian History were being taught to the bulk of the candidates. They recommended, therefore, that these subjects should be withdrawn altogether from the scheme of examination. They further recommended that English history should be separated from the language, and form a subject of itself; and that Modern Geography should be introduced as a separate voluntary subject. The obligatory minimum in some one modern language and in Geometrical Drawing was also recommended to be raised from one-tenth to one-sixth of the maximum of marks allotted to those subjects.

Hitherto 500 marks had been given to Roman and 500 marks to Greek History. It appeared to the Council, after very mature consideration, that it was doing no more than justice to the classical, which beyond all doubt is the staple, education of the country, and the value of which as a means of developing intellectual power the Council would be the first to acknowledge, to allot these marks to the Latin and Greek languages respectively, thus raising the value of each from 1,000 to 1,500 marks.

Lastly, the question how to secure a sound foundation in the earlier Mathematics, without at the same time discouraging the more advanced students from pursuing the studies which they were well able to do in the higher branches, required a very careful consideration. It would have been easy, of course, to cut off the examination at the point where

elementary reading ends and the higher course of reading begins. This would no doubt have been a positive advantage to very many candidates. But to others, on the contrary, it would have been a great injustice. On this point the Council fully adopt the view expressed by their colleague, the Rev. Canon Moseley, before he became a member of their board. In his report of the examination of June 1857, Mr. Moseley writes :—

"Admitting to its full extent the necessity of providing (so far as may be possible) that the candidates admitted to the Academy should at least possess a sound and thorough knowledge of the elements of mathematical science, I cannot, nevertheless, acquiesce in the opinion that has been expressed, that the examinations should be limited to those elementary subjects; because that would probably be to defeat the object in view, of providing that the successful candidates should have a thorough knowledge of those subjects; it being well known in the experience of the University and elsewhere, that the elements of mathematical knowledge are seldom thoroughly mastered by students until they have advanced considerably beyond them. To ignore this fact in our examinations would not be to do justice to the candidates who present themselves at them; nor would it, I am sure, be to consult the interests of the public service in the selection we make."

On the other hand, it was clearly necessary to take some step which might lead to a sounder instruction in the elements of Mathematics. The Council considered that this would best be effected by a modification in the scheme of marks. At this period the allotment of marks was as follows :—

Pure Mathematics (including 500 for the Differential Calculus)	2,500	3,500
Mixed Mathematics	1,000	

1,000 marks at least necessary for qualification, of which 700 marks at least had to be obtained in Pure Mathematics.

This distribution the Council recommended to be changed for the following :—

		Marks.	
Pure	Section I.—Arithmetic, Algebra, Euclid, Plane Trigonometry	2,000	3,500
	Section II.—Spherical Trigonometry, Elements of Co-ordinate Geometry and of the Differential and Integral Calculus	500	
Mixed.—Statics, Dynamics, and Hydrostatics		1,000	

700 marks at least to be obtained in the subjects named in Section I. of Pure Mathematics.

It will be seen at once that the effect of these alterations was to present a strong inducement to the student to work up thoroughly the elementary subjects constituting the 1st Section of Pure Mathematics, while, on the other hand, the incentive to unduly high reading which was created by the obligatory qualification of obtaining 1,000 marks in Mathematics generally was removed. It is true that the redistribution left so small a number of marks to Section II. of Pure Mathematics as to be wholly incommensurate with the value and the difficulty of the subjects it comprises. But this, it is believed, is no real objection to the scheme, when the age of the candidates is considered. The knowledge they can have of the subjects of that Section is necessarily elementary, and to apportion marks to them in proportion to their ultimate value when fully studied, instead of to their value in the form and degree in which a knowledge of them is possessed by the candidates, would be to lose sight of the reality in the mere appearance. With respect to Mixed Mathematics no change was made. High marks were still apportioned to them, and would be of important service in the competi-

tion when the required minimum on the lower subjects had been attained.

The changes proposed by the Council were sanctioned by His Royal Highness the Field Marshal Commanding in Chief and by the Secretary of State for War, and were first carried out in the examination of January 1863. The scheme as thus amended has remained in force up to the present time. It stands as follows :—

				Marks.
1. Mathematics	Pure	Section I.—Arithmetic, Algebra, Euclid, Plane Trigonometry	2,000	3,500
		Section II.—Spherical Trigonometry, Elements of Co-ordinate Geometry and of the Differential and Integral Calculus	500	
	Mixed	Statics, Dynamics, and Hydrostatics	1,000	
2. English Language and Composition				1,000
3. History of England, its Dependencies and Colonies				1,000
4. Geography (Modern)				1,000
5. Classics	Latin Language			1,500
	Greek ditto			1,500
6. French ditto				1,000
7. German ditto				1,000
8. Hindustani ditto				1,000
9. Experimental Sciences, *i.e.*, Chemistry, Heat, Electricity, including Magnetism				1,000
10. Natural Sciences, *i.e.*, Mineralogy and Geology				1,000
11. Drawing	Elementary Geometrical Drawing, including the use of Drawing Instruments			500
	Free-hand Drawing of Machinery, Architectural, Topographical, Landscape, or Figure Subjects			500

It has been already seen, in the report of Mr. Gordon (p. 23), that since the changes above described in the classical examination the work done by the candidates has improved, and he is hopeful of further improvement. Mr. Rawlinson has not reported directly upon this subject since the first examination under the new scheme, namely, that of January 1863, which was held about eight months after the changes had been announced, and which already gave promise, as appeared to him, of their working well.

With respect to Mathematics, the success of the amended scheme has been most marked. Canon Heaviside reported after the examination of July 1864 as follows :—

" I have often animadverted on previous occasions to the want of good grounding, even in the candidates who obtain fair marks; this fault is rapidly disappearing, and of the candidates generally who have obtained 600 marks* and upwards, I should say that they have a very firm and substantial hold of the elementary subjects, and are perfectly qualified to proceed to a high standard of Mathematics. Such candidates escape from all imputation of 'cram.' I hold it to be impossible that by any false and fictitious system of instruction any competitor could obtain 600 marks out of the papers I set in Pure Mathematics. Objections are sometimes taken that our papers are too difficult for youths of 16 or 17; the answer is, the questions are done, and done well, by candidates of that age; and when failures are attributed to the difficulty

* Assuming that the candidate received an equal number of marks from the other examiner, this would imply a total of 1,200 marks in Pure Mathematics. Of the 25 successful candidates in the examination here referred to, 19 obtained upwards of 1,200 marks. This, it will be observed, is considerably above the obligatory minimum, which is only 700. Of the six candidates who were below 1,200 marks, the lowest obtained 918 marks in Pure Mathematics.

of the papers, it must be remembered that where only 25 candidates are to be selected out of 120 competitors, those that are unsuccessful might make the same complaints if we only examined in the first four rules of arithmetic. Our examination must be greatly disappointing to many, when only a few can be chosen. So far as Mathematics are concerned, I believe a large class of the candidates are thoroughly well grounded and educated, and on this occasion the cases were few in which any candidates seemed to obtain telling marks in the voluntary subjects who had not had a good foundation in the obligatory. At the same time I take this opportunity of stating that, in my opinion, it would contribute still more to encourage candidates in mastering the elementary subjects before they advance prematurely, if the same rule were applied to the voluntary mathematical subjects that holds now with regard to other subjects, namely, that one-sixth of the marks, at least, must be obtained in order that those marks may be 'counted' in the aggregate result."

The above sketch will, it is hoped, be sufficient to show what have been from the first the object of those to whom has been entrusted the conduct of these examinations, and what have been the difficulties with which they have had to contend. It will be seen that the Council have pursued from the first an even course; that they have recommended no changes which did not seem called for by an extended experience of the working of the system, and which were not based on well-established facts; that, on the other hand, they have not hesitated to recommend important alterations of the scheme, where circumstances seemed really to require them.

That the programme of the examination requires no further modification they are far from supposing. The number of subjects allowed to be taken up, the generally indifferent character of the work produced by the candidates in Geometrical Drawing, the minimum of marks in the elementary section of Mathematics,—these, and other matters, may yet require amendment. All that the Council would here urge is, that the course they have from time to time recommended for adoption has been one of continued progress, and of progress always in the same direction, namely, that of depth as opposed to mere superficial extent of acquirement.

Whether the measures which have been above detailed will have the effect of bringing up well prepared candidates directly from the Public Schools, without the intervention of private tutors, time will prove. It must be confessed that up to the present time there has been no indication of so desirable a result. It has been seen that there is no difficulty in attaining to the required standard in the Colleges of Cheltenham and Marlborough. Modern Departments were there formed for the express preparation of boys for the public examinations. The Royal Commissioners on Public Schools think, however, that Modern Departments ought not to be required for preparing candidates for the army examinations under their present conditions:—

"The main studies" (they observe) of the Public Schools being classical, it is obvious that unless a due amount of weight is given to the Classics in the Woolwich examinations, boys from those schools will not stand a fair chance in the competition. On the other hand, as it is of importance that the examinations should comprise other subjects besides Classics, it is also obvious that unless the Public Schools provide a due amount of instruction in those other subjects, the candidates whom they send up must compete at a disadvantage. It is certain that there has been hitherto a want of adjustment between the Woolwich standard and the teaching of the Public Schools. The fault, we think, lies chiefly, though not wholly, in the deficiencies in the course of education pursued at the latter; and we are convinced that when those deficiencies have been supplied the difficulty which is now complained of will speedily disappear. But it is also to be observed, with respect to the Woolwich examinations themselves, that the scale of marks has lately (as we have already stated) undergone an alteration, which diminishes the amount of mathematical

attainment required, and allows greater weight to classical scholarship. It appears probable that the Modern Departments at Cheltenham and Marlborough would not have been what they are had the old Woolwich standard, which is stated to have influenced them so strongly, been the same as the present; and it is probable also that they will hereafter feel the effects of the change which has been made in it."*

From another passage in their Report the Royal Commissioners seem to have been clearly of opinion that means could be taken at the Public Schools for preparing a candidate for the Woolwich examinations without forming any special department for this purpose, and by merely discontinuing certain studies in individual cases, in order to allow extra reading in others. (See Report of Commission on Public Schools, vol. 1, p. 39.)

If this be so—and it must be remembered that this conclusion has been arrived at by independent judges, with certainly no bias against Public School education, and after a long and exhaustive investigation—it must follow that the public examinations are now fairly adapted to that which, at least, ought to be the education of the country. At the same time, the Council will ever be ready to give their best consideration to any further measures that may be suggested for the more complete attainment of this essential object.

The following table gives the results of the several competitive examinations for admission held under the superintendence of the Council of Military Education.

Date of Examination.	Number of Candidates examined.	Number of Candidates who qualified.	Proportion of qualified Candidates per cent.	Number admitted to Royal Military Academy.	Minimum of Marks for Qualification.	——
1859, July -	106	53	50	40	2,500	
1860, January-	110	64	58	64	2,000	
„ July -	159	43	27	43	2,500	
1861, January-	229	129	57	82	„	
„ July -	247	116	47	65	„	
1862, January-	204	91	44·5	59	„	
„ July -	216	88	40·75	49	„	
1863, January-	198	78	39·5	20	„	
„ July -	136	70	51	34	„	One resigned.
1864, January-	141	92	65	40	—	Two resigned.
„ July -	116	74	64·5	25	„	
TOTAL -	1,862	898	—	521	—	

From the above table it will be found that on the average of the whole period 58 per cent. of those qualified were admitted to the Academy. This per-centage, however, was considerably higher during the first years, when the numbers on the establishment of the Academy were being increased, than it has been latterly. In fact, during the last two years, when the number of vacancies have been comparatively few, only 38 per cent. of the qualified candidates have been admitted.

The large numbers admitted in January 1861 and at the three following examinations will have been remarked. This was due to the amalgamation of the Royal Artillery and Royal Engineers with the Artillery and Engineers in the service of the late East India Company. It became then a question whether the Military College at Addiscombe

* Report of Royal Commission on Public Schools, vol. 1, p. 38.

should be retained, together with that of Woolwich. As Addiscombe did not possess the same facilities which the Royal Arsenal at Woolwich afforded for practical instruction, it was not possible to give the same education to the cadets at the two institutions. To make the former college preparatory to the latter by imparting there the preliminary theoretical instruction was thought open to much objection, as it would involve an entire change to the cadet of his officers and masters in the middle of the course. It was finally decided to suppress Addiscombe College, and to make all candidates for the amalgamated Artillery and Engineers pass through the Academy at Woolwich.

The number of additional appointments to the Royal Military Academy on this account was estimated by the Indian Government, in April 1861, at 80 for that year. This included an allowance of 6 per cent. for prospective casualties in addition to the then existing vacancies. On the estimate of 6 per cent. for casualties the Indian Establishments of Artillery and Engineers would, it was understood, require about 60 first appointments annually. These, added to the same, or nearly the same, number of first appointments to the Royal Artillery and Royal Engineers, would make about 120 first appointments annually to the amalgamated corps, and therefore about 120 appointments annually to the Academy, involving an establishment of 300 cadets. It was subsequently found that that estimate was considerably in excess; the demands of the two corps being 80 per annum, requiring an establishment of only 200 cadets. This has occasioned much difficulty as to the disposal of a large number of cadets, for whom, on leaving Woolwich Academy, there have been no immediate vacancies. Should they be required to wait for any considerable time before receiving their commissions, much of the knowledge they have acquired at the Acadamy might be lost for want of the necessary application to practice; while, on the other hand, the difficulty was very great of allowing the authorized establishment of officers to be exceeded. It has been decided, on the recommendation of the Council, that until the excess of qualified cadets is reduced, every cadet, after finally passing, shall return home until there is a vacancy in the fixed establishment of the corps; provided that under no circumstances such cadet shall be kept longer than six months without a commission.

The reduced estimate of the number of first appointments has therefore led to the establishment at the Royal Military Academy being reduced from 300 to 200 cadets.

IX.

Course of Instruction at the Royal Military Academy.

The period of residence at the Royal Military Academy is ordinarily two years and a half, divided into five terms.

Assuming 18 working weeks for each term, the following are at present the number of lessons in each subject given through the entire course.

	No. of Lessons.
Mathematics	216
Practical Mechanics and Natural Philosophy	72
Descriptive Geometry	126
Fortification	252
Artillery	198
Plan Drawing and Surveying	198
French	144
German or Hindustani	144
Chemistry	54
Geology and Mineralogy	18
Free-hand Drawing	108

Of these subjects, Mathematics, Descriptive Geometry, and Free-hand Drawing are discontinued after the third term, and Foreign Languages after the fourth term. Examinations are held in them by the Council at the end of those periods, and the marks gained are carried forward to the final examination. The studies in Artillery, Chemistry, Natural Philosophy, and Practical Mechanics, commence with the fourth term; and those in Geology with the fifth term.

The Council had early in view the desirableness of giving to the fullest possible extent a practical direction to the studies of the Academy. On the 5th January 1859 they forwarded a memorandum to His Royal Highness the Field Marshal Commanding-in-Chief, in which they recommended that the distinction of theoretical and practical classes, which had hitherto obtained, should be abandoned, and that the Institution should be considered strictly as a school of application, theory and practice being taught, as far as possible, simultaneously from the beginning to the end of the course. It was at the same time suggested that the mathematical text-book in use should be either in part replaced by treatises of a more practical character, or modified and extended by the introduction of supplementary matter in occasional papers printed or lithographed at the Academy.

At the request of the Council, the Rev. Canon Moseley drew up about the same time a scheme of mathematical instruction for the Academy, considered as a school of application, which will be found in Appendix No. X. It has not been found practicable to adopt that scheme in its entirety, but its general principles have been acted upon, and it is still most valuable as presenting a standard which it is hoped may some day be reached. The main difficulty at present is that there are comparatively few mathematicians in this country who have directed their investigations to questions of practical mechanical science, while the treatises of English authors on practical mechanics are in general either too elementary or too advanced for youths of the age of the cadets at the Academy.

To carry these views into effect it was recommended that a professor of mechanics should be appointed, who should lecture on the principles of mechanism, &c. and of engineering, illustrating them by experiments and by means of models. The subject of each lecture should (it was proposed) be communicated to the mathematical masters of the class to which it was delivered, in order that it might be made the basis of their class tuition, thus combining the theoretical and practical instruction.

The appointment of the Professor of Mechanics was sanctioned. The particular mode, however, in which it was suggested that his instruction should be given has not been followed. This has been to the Council a matter of regret, but it has been to a certain extent unavoidable. It was found that too many subjects were in hand at the same time, and it was therefore thought desirable that mathematics, pure and mixed, should be taught in the first three terms, and practical mechanics in the last two terms. The Professor of Mechanics, therefore, commences his lectures with the cadets who, after passing their final examination in mathematics, enter upon their fourth term. He gives them one lecture a week during that term, and two lectures a week during the following or fifth term. Although the instruction thus given cannot fail to be valuable, it will be readily seen that it differs in one most important respect from the scheme originally proposed. The lectures of the Professor are not begun before the course of mathematical study has ended.

The result is, that the lectures lose something of that mathematical character they should possess, while the mathematical teaching similarly loses something of that practical character which it would have if it were combined with the lectures of the Professor of Mechanics.

The great difficulty at this, as at all other institutions for scientific military education, consists in the great number of subjects which it is thought necessary to teach. The acquirements which may be useful to an officer of either of the Scientific Corps are indeed very various. The advance of modern science has added to the number of subjects considered indispensable, and, as the matter now stands at Woolwich, there are no less than 11 subjects in which a cadet has to be examined before he leaves the academy. It is true that these are not all taken up at the same time ; that examinations are held in some at the conclusion of the third and fourth as well as of the last term ; but the fact nevertheless remains, that during a residence of $2\frac{1}{2}$ years the cadet is instructed with more or less fullness in eleven subjects. While, however, it is their duty to mention this, the Council must admit that there does not appear to them at present any remedy. In nearly every subject good work is produced by some ; and although a greater concentration of attention on some of the more special subjects would doubtless be an improvement, it would have to be accomplished at a sacrifice of general attainment which the Council, at present at least, are not prepared to recommend.

A synopsis of the course of instruction at the Royal Military Academy will be found in Appendix No. X.

The reduction of the establishment from 300 to 200 cadets has enabled the Council to recommend an important reduction in the Educational Staff. Should this reduction be carried out the establishment of Instructors will be as follows :—

	No. of Professors.	No. of Masters.
Mathematics	1	3
Fortification	1	4
Artillery	1	3
Surveying	1	4
French	1	2
German	1	2
Hindustani	—	1
Practical Geometry	—	3
Practical Mechanics	1	—
Chemistry	—	1*
Geology	—	1*
Free-hand Drawing	—	2
Total	7	26

* Lecturer.

This gives a total of 33 masters to 200 cadets, or, on the general average, 1 master to 6 cadets. But this mode of statement may lead to misapprehension. The number of masters is not, in fact, excessive when the number of subjects taught is considered. By the actual arrangements of the Royal Military Academy about 15 cadets are, on an average, instructed at a time by one master ; and as the efficiency of the special instruction there given depends very much on the amount of attention the teacher can bestow on individual pupils this average could not be safely exceeded.

Notwithstanding the severity of the test for admission, it is not found that all who enter succeed in passing through the Academy to their Final Examination. Since 1859, 15 cadets, or an average of three a year, have been withdrawn by their friends, as not being likely to qualify for a commission in the Royal Artillery or Royal Engineers. This gives an average, on the whole establishment, of 1·3 per cent. withdrawn on this account. It was stated in 1857 by the Commission of Inquiry into the Training of Officers for the Scientific Corps, that up to 1854 the average number of cadets who did not obtain their commissions was more than 25 per cent. The comparison of these averages shows the effect of the competitive examination for admission.

X.

EXAMINATION FOR COMMISSIONS IN ROYAL ARTILLERY AND ROYAL ENGINEERS.

The qualifications of the cadets in the several subjects are tested by a final examination, which takes place, as has been stated, at the end of the third term, in Mathematics, Practical Geometry, and Free-hand Drawing ; at the end of the fourth term in the Modern Languages ; and at the end of the fifth term in Fortification, Artillery, Surveying, Practical Mechanics, Natural Philosophy, Chemistry, and Geology. Formerly an obligatory minimum was exacted in all the principal subjects. Although it was certainly desirable that every officer on entering either of the Scientific Corps should possess as much knowledge of each subject of instruction as that obligatory minimum was held to represent, yet the system was found to act injuriously in many cases, by rendering cadets disqualified by failure in one subject who had nevertheless shown great intelligence in several others. Thus the marks gained by qualified candidates were sometimes less than those gained by unqualified candidates, and qualification and disqualification ceased to that extent to represent the comparative intelligence of the examined. The Council recommended, as in the case of the Staff College referred to in a previous part of this Report*, that an obligatory minimum of marks should be enforced, not on individual subjects, but on the aggregate of marks counted on all subjects ; but that, in order to secure proper attention to each subject, no marks gained in it should be allowed to count towards the aggregate, which did not exceed a certain proportion of the maximum of marks assigned to it. This recommendation has been carried out, and the result has been, up to the present time, in every respect satisfactory.

The questions set at one of the final examinations are printed in Appendix No. XI.

The following are extracts from the Reports of the Council on the Final Examinations of June and December 1864. The examiners whose reports are recorded are those employed under the Council, and are independent of the Academy.

December 1864.

The Council of Military Education are happy to report to His Royal Highness the Field Marshal Commanding-in-Chief, that the results of this Examination, as shown by the marks gained, are satisfactory, but they regret to report that one cadet has failed to attain the aggregate of marks necessary for qualification.

The Examiner in Fortification appears to consider the result to be satisfactory.

The Examiner in Artillery considers the result very fair. The gentleman whose index number is 1 deserves to be specially mentioned, his answers to the questions are very full and satisfactory.

* See page 9 supra.

The Examiner in Plan Drawing and Surveying reports that the Drawings from copies and models, though on the whole very fair, had amongst them no work of a superior description.

In Surveying. — The replies were generally better than usual, and the Examination Sketches showed improvement, though the class contained few really good draughtsmen.

The Examiner in Chemistry observes that he was very well pleased with the answers sent up. They showed evident signs of a good deal of attention and industry; indeed the cadets must have followed the lecturer very closely, for it could easily be seen from the answers where the examiner's questions had at all exceeded the limits of the course. In some of the answers there was a certain amount of confusion as to details of Metallurgy which seemed to show a bookish rather than a practical knowledge, but perhaps this is necessarily incident to the learning of such a subject anywhere but beside the furnace. In Analytical Chemistry the answers were for the most part very good, and on the whole the results of the examination are considered very satisfactory.

The examiner in Geology reports the general proficiency in Mineralogy and Geology this year to be but very moderate. 12 out of the whole number gained 50 per cent. of the maximum number of marks, but none of these can be mentioned as passing with special distinction. The crystallographical part and drawing of the figures is on the whole creditable, considering that but very little time has been devoted to the lectures in the subject.

In the foregoing subjects those cadets were examined who are about to leave the academy. In the following, the cadets either of the third or fourth term were finally examined, and the marks obtained in them will be carried forward to their credit in the examination for commissions.

The examiners report as follows:—

French.—The present examination is good, with the small exception of four that do not reach half the marks allowed as maximum. The papers are generally satisfactory in their different divisions, evincing serious application and careful working, a sound knowledge of the principles of the French grammar in accidence and syntax, an easy understanding of French texts, and in a fair proportion of them, a very creditable facility in writing from dictation, and in composition (essay and translation from English into French).

German.—I have every reason to be satisfied with the result of the recent examination at the Royal Military Academy. This examination has been by far the best of all I held there for the last five years. 13 out of 22 students have gained more than half the assigned marks, and one only has failed in gaining $\frac{1}{6}$ marks. I would point out index numbers 53 and 61 as those who particularly distinguished themselves, having gained 668 and 663 marks respectively.

Hindustani.—The result of the examination is upon the whole satisfactory, more particularly when it is remembered how short a time the cadets are able to devote to the study of Hindustani.

The papers of number 173 are of unusual excellence.

Free-hand Drawing.—The Drawings produced during the half year are almost entirely water-colour drawings of no great merit. The model drawings are neither numerous nor good. A few attempts have been made to use the pen, but the specimens, with one exception, betray want of knowledge. Where good etching have been selected the copies are neither accurate nor intelligent. The sketches from nature are seemingly the very first attempts, and show no power of drawing actual objects.

The work done before me consists of drawing from models and copies of works copied before. The model drawing is in general far from good, but the copies are, as copies executed in limited time, very fair, and commonly prove that the students have acquired the power of copying in a particular style.

On neither of the last examinations have I seen any drawings of special merit, but at the same time there are very few entire failures, the average I have no doubt do better than when I first inspected the drawings at the Academy, and so far the result is satisfactory.

Mathematics.—The marks themselves are the best exponents of the result of the examination; many of the cadets have done exceedingly well, and evince a high degree of mathematical proficiency. I may draw attention particularly to

the marks of number 145, 99, 126. The higher subjects of this examination reach over a wide range, and unless the cadets were well grounded on admission, amidst the various studies pursued at the Academy it would be well-nigh impossible for them to attain to the degree of forwardness which their examination now shows.

I fear the marks of the examination may point to probable failures.

However, as will be seen from my report, the greater part of the candidates have done well, and I think the Council may be congratulated on having such young men to recommend for their promotion.

June 1864.

The Council are happy to report to His Royal Highness that the results of this examination are satisfactory, both as shown by the high marks gained, and by the fact that no gentleman cadet has failed.

The Examiner in Fortification reports that the answering in the "course" of Fortification has been particularly good, many of the cadets having obtained full credits for a large proportion of the questions.

In Field Works and Military Bridges, more especially in the latter subject, the answering was not so good. The Council trust that this notice will induce future candidates to give these important subjects a little more attention.

The Examiner in Artillery reports that the answers to the questions have been generally good, and especially those to the extra papers. The Council are very happy to bring to the notice of His Royal Highness the care and attention which the gentleman cadets are evidently giving to this most important subject.

In Military Surveying the examiner reports the work copied from sketches and models of ground to be generally fair, although none of the cadets showed great proficiency. Excluding the questions relating to Practical Astronomy, the surveying questions were fairly answered. The diagrams of a triangulation were generally fair, and several of them were good. The examination sketches showed improvement in manipulation, but still they were not so good as the previous training might be expected to produce.

The Examiner in Chemistry states that the results of the examination in that subject may be considered, on the whole, very satisfactory.

The average marks gained are a little greater than the average at this time last year, though the answers at that time also were generally good. In one respect, however, he thinks the answers this year are not so good as they were last year, namely, in the indications they give of a thorough comprehension of principles of Chemistry, and their application to the processes in question. The knowledge of facts seems as good or better than it was last year, but there are more cases in which the general laws seem to be imperfectly comprehended, or in which perhaps sufficient thought has not been given to their bearing on practice.

In Geology the Examiner considers the result satisfactory.

In the foregoing subjects those cadets were examined who are about to leave the Academy. In the following, the cadets either of the third or fourth terms were finally examined, and the marks obtained in them will be carried forward to their credit in their examination for commissions.

The Examiner in Mathematics reports that in his first and second papers, containing matter in which candidates who gained admission to Woolwich are generally prepared, the cadets show the permanence of their knowledge by the satisfactory marks they have obtained. In the Mixed Mathematics, which are the subject of the third paper, the cadets show very unequal attainments, some of them possessing a sound and available knowledge of these subjects, while others, as yet, imperfectly apprehend the fundamental principles of physical science. In the extra course, Spherical Trigonometry appeared to have been generally read, and the questions were well answered. Three cadets showed good power in questions of Practical Mechanics. Few of the cadets were able to integrate with readiness and accuracy.

In Practical Geometry the Examiner reports that the answering of the questions in the "course" has been generally satisfactory, and in many cases exceedingly good, but of those who have attempted the "Extra Subjects" but few have given good solutions of the questions.

The Examiner in French reports the general results of this examination to be highly gratifying. There were several creditable papers, and some cadets have exhibited an uncommon degree of proficiency. In others there had been, apparently, a want of steady application to Grammar, leading to inaccuracy.

The Examiner in German reports that this is by far the best examination in that language he has held at the Academy, and the result will no doubt prove an encouragement both to teachers and students.

In Hindustani the Examiner reports that the result is, upon the whole, satisfactory.

The questions in Grammar were generally well answered, and in one or two instances the composition was very creditably done. The least successful part of the examination was the translation from Hindustani into English.

In Free-hand Drawing the Examiner reports that the drawings executed by the cadets during the last half year show that although none of them are very far advanced all have taken great pains with their work, and in some instances rapid progress has been made.

In the work done before me the chief thing to be noted is that the drawing was generally inferior to that in the portfolios. In the morning the drawings were made from casts of my own choosing, and in the afternoon they repeated for me a portion of their last work, and in both cases commonly there was a failure in drawing as well as some of their previous productions. I do not attribute this to any unfair help having been given, but the want of having the intellectual part of the subject kept sufficiently before them. In both copies and drawings from the solid there is a want of intelligent observation of the aspects of objects. The mechanical portion of the subject was very fairly done.

It is also, perhaps, worth remembering, that at the admission examination none of the successful candidates drew well who presented themselves for examination in Drawing, and therefore it may be presumed that considerable time has been spent in learning the first principles of the subject. Several attempts at Pen-and-ink Drawing have been made, but with little success in most instances.

The following Table shows the results of the final examinations of the Cadets of the First Class since the date of the Council's last Report.

Date.	Strength of Class.	Passed.			Finally failed.	Appointed to the	
		At the time.	At a special examination.	At the next final examination.		Royal Engineers.	Royal Artillery.
1860 June	38	38	—	—	0	7	31
1860 October	26	26*	—	—	0	5	21
1860 December	30	21	—	—	0	3	18
1861 March	—	—	8	—	0	1	7
1861 "	—	—	1	—	0	—	1
1861 June	24	22	—	—	0	6	16
1861 "	—	—	2	—	0	—	2
1861 December 1st Class	38	38*	—	—	0	13	25
1861 December Special Class	28	28*	—	—	0	9	19
1862 June	48	41	—	—	0	20	21
1862 September	—	—	7	—	0	—	7
1862 December	49	48	—	1	0	20	28
1863 June	44	43	—	1	0	12	31
1863 December	68	65	—	3	0	22	43
1864 June	56	56	—	—	0	19	37
1864 December	42	41	—	—	1	14	27
	491	467	18	5	1	151	334
Deduct failed - 1	6	485				485	
Appear twice in 1st Column - 5							
	485						

* On these three occasions 9, 6, and 11 cadets respectively did not gain the qualifying minimum in certain subjects, but owing to the peculiar position in which they were placed by the change of system then going on, they were all recommended for commissions.

From the above table it will be observed that of 486 cadets who entered the first class, 485 have during the last five years qualified for commissions in the scientific corps, of which 151 have received or will receive commissions in the Royal Engineers, and 334 have received or will receive commissions in the Royal Artillery.

XI.

EXAMINATION FOR ADMISSION TO THE ROYAL MILITARY COLLEGE, SANDHURST.

In the former Report of the Council the advantages were stated which would result from the Royal Military College being so extended as to include all candidates for commissions in the Cavalry and Line. It was represented, that though the test in the subjects of general education imposed upon candidates in their examination for direct commissions afforded a guarantee that those who passed had received the ordinary education of a gentleman, it afforded none whatever of their having acquired any knowledge of theoretical military science.

No means existed of imparting such knowledge to officers who were doing duty with their regiments. In consequence a large number, probably the majority, passed their entire military service without ever acquiring that moderate amount of scientific military knowledge which might be most valuable both to themselves and to the Army. It was added, that while the general education of officers had better continue to be intrusted to the public schools and other establishments, there was only one way in which a professional education for all could be effectually provided, namely, by means of a Military College, which should include candidates for all branches of the service except the two Scientific Corps, for which provision was already made in the establishment at Woolwich.

These arguments were fully considered by His Royal Highness the Field Marshal Commanding-in-Chief and the Secretary of State for War, and in 1861 the necessary application was made to Parliament for the sum required for the enlargement of the buildings of the Royal Military College, with a view to its affording accommodation for 600 cadets. The scheme, however, met with much opposition, and the Government engaged that the proposed system should not come into operation till the midsummer of the following year, in order that Parliament might have a further opportunity of expressing an opinion upon it.

The question having been reconsidered in the interval, it was decided to limit the extension of the College to an establishment of 336 cadets (the former establishment having consisted of 180 cadets), and that the original scheme proposed by the Council, should, with this limitation, be carried out. It was therefore determined—

1st. That candidates should continue to enter the Army either by receiving their commissions direct, after a qualifying examination in the subjects of general education, or after passing through the Royal Military College.

2nd. That with a view to encourage candidates for the Army to go through a course of military science, all non-purchase appointments to first commissions, with exception of those which are bestowed on deserving non-commissioned officers, and in West India Regiments, should be thrown open to competition amongst the cadets of the Royal Military College.

3rd. That the course of instruction should be arranged for a residence of one year, at the end of which period the cadet should be examined for his commission, with or without purchase; but that if unsuccessful at that time he might return for another term, and have a second trial.

4th. That while admission to the College should be determined in general by a competitive examination, candidates who had passed

certain examinations at the Universities should be exempted from the competition.

5th. That, in addition to the 20 Queen's cadetships for which provision was already made by Parliament, there should be 20 cadetships to which candidates should be nominated by the Secretary of State for India in Council. The maintenance and education of the cadets thus nominated were to be free. The 20 Queen's and 20 Indian cadets were to be included in the total establishment of 336 cadets.

The question of the enlargement of the Royal Military College to the limited extent above stated having been submitted to Parliament in 1862, was agreed to after considerable discussion; and the College, reorganised on the plan just described, is now being gradually raised to its full establishment. The number of cadets during the term just concluded was 281.

The following Table shows the general result of the examination for admission to the College as now constituted.

Date of Examination for Admission.	Examined.	Passed.	Failed.	Per-centage failed.
June 1862	117	95	22	18·8
December 1862	128	105	23	18·
June 1863	156	128	28	18·
December 1863	131	110	21	16·03
June 1864	184	147	37	20·1
December 1864	149	111	38	25·5
TOTAL	865	696	169	—

The College not being yet at its full establishment, there has hitherto been no competition, but only a qualifying examination for admission, and the numbers in the third column of figures denote absolute, not relative, failure in the examination.

The general character of the examination for admission is the same as that for direct commissions. Nothing professional is required, and the subjects are so balanced as to place candidates from the classical schools, and from those in which the more modern system of education is provided, as nearly as possible on a footing of equality.

The following are the marks assigned to the respective subjects—

	Maximum.	Minimum allowed to count.
Classics { Latin	2,000	333
Classics { Greek	1,600	266
Mathematics { Obligatory	1,200	400
Mathematics { Voluntary	2,400	—
English Language	1,200	200
Modern Languages (each)	1,200	200
History, with Geography	1,200	200
Natural Sciences (i.e., Mineralogy and Geology)	1,200	200
Experimental Sciences (Chemistry, Heat, and Electricity, including Magnetism)	1,200	200
Geometrical Drawing	600	100
Free-hand Drawing	600	100

Arithmetic, Algebra to Simple Equation inclusive, and the first three books of Euclid, are obligatory on all candidates, and 400 out of 1,200 marks are required to be obtained in them, of which at least 200 must be obtained in Arithmetic.

"English" is also an obligatory subject, and a minimum of 200 marks is required to be obtained in it.

Lastly, an aggregate of at least 1,500 marks is required to be gained by every candidate for qualification.

The question papers for admission to the College are published immediately after the examination. The educational qualifications of the candidates may be judged of from the Tables in Appendix No. XII., showing the analysis of the marks awarded in the four examinations from June 1862 to December 1863, of which the following is an abstract.

Subject.	Per-Centage of Candidates examined in each Subject, whose Work, as denoted by Marks, was				
	Bad.	Moderate.	Fair.	Good.	Excellent.
	Below $\frac{1}{6}$ of Maximum.	From $\frac{1}{6}$ to $\frac{1}{3}$.	From $\frac{1}{3}$ to $\frac{1}{2}$.	From $\frac{1}{2}$ to $\frac{2}{3}$.	From $\frac{2}{3}$ to Maximum.
Latin	34·5	39·9	16·3	8·6	0·7
Greek	42·8	33·3	18·9	3·5	1·5
Mathematics (Obligatory course)	2·2	4·2	15·0	21·1	57·5
Do. Voluntary	62·9*	15·8	10·9	6·0	4·4
English	4·4	47·8	40·3	6·9	0·6
French	13·2	31·2	25·0	17·3	13·3
German	12·2	29·9	26·1	21·5	10·3
History	17·5	50·3	21·5	9·3	1·4
Natural Sciences	37·9	37·8	15·0	9·3	—
Experimental Sciences	19·4	16·3	29·3	16·3	18·7
Geometrical Drawing	49·5	38·7	10·1	1·4	0·3
Free-hand Drawing	41·3	44·9	8·6	3·4	1·8

* The first column in this case does not denote "Bad" work, but merely a small amount of mathematical work in addition to the obligatory section.

Except as regards Mathematics, the first column of figures in the above table denotes the per-centage of candidates who, having taken up a subject, failed to count marks in it towards their aggregate. In English this failure constitutes disqualification. In the obligatory section of Mathematics the two first columns represent failure to qualify; their amount is 6·4 per cent. In the voluntary Mathematics which begin at the point where the obligatory section ends, no minimum is imposed.

In Classics, the large number of candidates whose marks are below the minimum, viz., 34·5 per cent. in Latin, and 42·8 per cent. in Greek, adds another to the many proofs already given of the frequency of the cases in which, from whatever cause, classical education is defective.

In the obligatory portion of Mathematics the larger number of candidates, viz., 78·6 per cent., who obtain more than half the maximum of marks, shows that the amount of elementary Mathematics required is no more than can fairly be expected; while in the higher Mathematics, ranging from Euclid Book IV. to Elementary Mechanics, the per-centage of candidates, 21·3, who obtain more than $\frac{1}{3}$ the maximum, is an evidence of the increased culture of this important subject.

In History, the large number of candidates in the second column of figures indicates that the average degree of attainment in this subject is still only moderate, while the third column shows that only 10·7 per cent. obtain more than 600, or one half of the maximum of marks.

In Natural Science and in Geometrical and Landscape Drawing, the results are but indifferent, but in Experimental Science the high figure in the third column shows that this subject is making its way successfully in English education.

In the English Language the great majority of candidates appear in the 2nd and 3rd columns of figures, denoting moderate or fair knowledge. This indicates probably that English is as yet only partially cultivated as a subject of general education, the candidates relying for the marks they hope to obtain rather on their spelling and composition than on their successful study of the language.

The two modern languages, French and German, show nearly the same results in each column. And when we compare the actual numbers of marks gained in Latin with the numbers gained in those Modern Languages, as shown in the following Table, the results are also found to agree very closely.

Subject.	Per-centage of Candidates who obtained Marks.			
	From 0 to 200.	200 to 400.	400 to 600.	Above 600.
Latin - -	16·2	32·5	19·9	31·4
French - -	13·2	31·2	25·0	30·6
German - -	12·2	29·9	26·1	31·8

This fact seems to show that the comparatively large maximum of marks assigned to Latin is no more than sufficient to place it on an equality with French or German in respect to the number of marks generally obtained.

The above analysis of the examinations for admission to the Royal Military College would be incomplete without a reference to the general qualifications of the successful candidates. It has been already stated that the minimum aggregate of marks is 1,500. The following were the marks actually obtained in the examination of December 1863, which may be taken as a fair specimen.

Marks.	No. of Candidates.
From 0 to 1,500 constituting failure - -	19
1,500 to 2,500 moderate - - -	35
2,500 to 3,500 fair - - - -	30
3,500 to 5,000 good - - - -	24
5,000 to 6,000 very good - - -	13
6,000 to 7,000 excellent - - -	7
7,000 to 8,000 „ - - - -	2
8,000 to 9,000 „ - - -	1
	131

From this it appears that 23 out of 131 candidates, or about 17 per cent., passed an excellent examination, while 54 other candidates, or about 41 per cent., passed a "good" or "fair" examination. These facts seem to place beyond a doubt the satisfactory attainments of a very fair proportion of the candidates admitted to Sandhurst.

XII.

Course of Instruction at Royal Military College and Final Examination for Commissions.

The organization of the College for educational purposes has been from the first a matter involving much difficulty, on account of the short time allowed for the course of instruction. It was essential that the classes should not be large, as much individual teaching would be necessary. It was equally essential, for the sake of economy, that the multiplication of classes should not entail with it too large a staff of masters. To meet these opposite requirements, the Council submitted a scheme in 1862 by which the cadets were to be distributed in two divisions for educational purposes; each division being composed of six classes, arranged in every subject of study according to proficiency. The whole of the masters in any subject were to attend one of these divisions at the same time. Each division would thus constitute a complete college in itself, although all the divisions would be under the instruction of the same masters. This arrangement was approved of by His Royal Highness the Field Marshal Commanding-in-Chief, and its success justified the Council, in 1863, when the cadets increased in numbers, in recommending an extension of the principle, by arranging the cadets for purposes of instruction in three instead of in two divisions, each division continuing, as before, to consist of six classes.

This recommendation was approved of by His Royal Highness and the Secretary of State for War, and was first carried into effect in February 1864.

In each subject, as before stated, the divisions are classified according to proficiency, the only exception being that the newly-joined cadets are kept distinct from the old cadets. By this mode of classification the inconvenience is avoided which often obtains at schools or colleges where many subjects are taught, namely, that of mixing in the same class students of very varied degrees of attainment. The most advanced cadets in Mathematics, for instance, in each division, are in the first class of that division so far only as respects Mathematics, and the most advanced cadets in French are similarly in the first class in French, and so on.

In the final examination for commissions the three or four senior classes in each division, consisting of the cadets who have been more than one term at the college, enter the competition. The system is found to work very advantageously.

Each of the three divisions being divided, as before mentioned, into six classes, there are in all 18 classes, assembled in as many separate halls of study. The classes consist at present, on an average, of 15 or 16 cadets each. When the College attains its full establishment of 336 they will consist of 18 or 19 cadets each; a number which could not be exceeded without over-crowding them. This is indeed considerably below the number that usually forms a class at a public school; but it must be remembered that many of the subjects are new to the cadets, and that a greater amount of individual, as distinguished from class, instruction is requisite. The latter remark is especially applicable to those studies which, as, for instance, Fortification and Surveying, require a considerable amount of mechanical teaching as well as explanation of principles. But it is also more or less applicable to all studies in a college in which, like that of Sandhurst, the course of instruction is of very limited duration.

Corresponding to the six classes in each division, there are six masters in each leading subject, viz.:

In Mathematics -	-	1 Professor,	5 Masters.
Modern Languages	French -	1 „	3 „
	German -	1 „	1 „
Fortification -	-	1 „	5 Instructors.
Surveying -	-	1 „	5 „

For the instruction in Military History, which is chiefly given by lecture (the cadets taking notes, and afterwards forming them into memoirs), one professor and two instructors are borne on the establishment.

There is one professor for the lectures in Physics and one for Geology.

For teaching Landscape Drawing, one professor and one master.

In all 31 professors and masters.

When the College is at its full establishment of 336 cadets the staff of masters will not probably have to be increased. There will then be 336 cadets and 31 masters, or about 11 pupils to one master. It will be remembered that this does not represent the proportion actually under instruction at a time in a class, which in fact is 18 or 19. The apparently small proportion of pupils to masters arises of course from the number of subjects taught.

The professors have the same duties as the masters, but their salary is superior, and the appointment is distinct. On a vacancy occurring among the professors, the candidate possessing the highest qualifications is selected, whether he may have previously served at the Royal Military College in the lower capacity or not.

A synopsis of the course of study at the College is printed in Appendix No. XIII. It comprises Mathematics, French or German, at the option of the cadet, Fortification, Military Drawing and Surveying, Military History and Geography, Free-hand Drawing, and Lectures in Physics and Geology. The three last-named studies are optional to the cadets. They are, in general, very well attended.

The limited time at disposal only admits of a cadet learning one modern language at a time; but he can pass from one to the other language on certain conditions, and he can take up both languages at the final examination.

There are 21 studies in the week of an hour and a half each. These are distributed as follows:

	No. of Studies per week.
Mathematics - - - -	4
Fortification - - - -	4
Military Drawing and Surveying -	4
Military History and Geography -	2
French or German - - -	4
Chemistry (optional) - - -	1
Geology (optional) - - -	1
Free-hand Drawing (optional) - -	1
	21

Soon after the establishment of the present system it became evident that more encouragement was required to be given to the studies of

the cadets who were in their first half year. Although the period of the whole course was only one year, it was found that too many would put off their work to their second term, trusting to their final efforts for success, rather than to that steady persistence in study which can alone give satisfactory results. The Council, therefore, recommended, in July 1863, that a portion of the marks allotted to the various subjects in the final examination for commissions should be competed for at the examination held at the end of the first term. The proportion fixed upon was, in most of the subjects, one fourth of the maximum. The cadets of the first term were to be examined on the same papers as were set by the Council's examiners to the commission class, but the marks were to be awarded by the professors and masters of the College instead of by the Council's examiners. The effect of this measure, so far as at present appears, has been very satisfactory. The cadet has now a definite object to work for from the commencement of his career, and it is believed that the cases of idleness are much fewer, and the progress made by the majority of the cadets much greater.

In Appendix No. XIV. are printed the examination papers used in the competitive examination for commissions without purchase held at the College in December 1863, which may be taken as a fair representative both of the ordinary examinations for commissions and of the work done by the cadets. An analysis of the number of marks obtained by the cadets accompanies each paper.

The number of cadets who have obtained commissions without purchase at the final examinations which have been held since the establishment of the present system is as follows:—

June 1863	30*
December 1863	36†
June 1864	40
December 1864	41

These are exclusive of the commissions without purchase granted to the Queen's and Indian cadets who passed the qualifying examination.

The following are extracts from the reports of the Council on the final examinations held in the present year.

Examination of June 1864.

The Council are happy to report that the general tenour of the examiners' reports is very satisfactory.

The Reverend Canon Heaviside, who examined in Mathematics, reports his examination to have been on the whole eminently satisfactory. A very large number have obtained high marks in the obligatory portion of the subject; many of the cadets did well in the second section, ending with Trigonometry; and a few did well also in the Mixed Mathematics of Section III. The examiner adds, "although it would be going much too far to say that there "were no signs of idleness among the cadets examined, yet I feel sure that "the greater part must have applied themselves industriously to the studies "of the College, whilst many have shown a mathematical proficiency that "bears evidence of very hard work in combination with considerable mathe-"matical ability."

The Examiner in Fortification reports that he considers the cadets have shown a fair comprehension of the subject of Fortification generally, many of them showing considerable merit in their treatment of the higher subjects.

The Council are glad to observe that the cadets of the second term took up the subjects of the higher Fortification course on this occasion, and in many cases successfully.

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* Of these one half were competed by the cadets under the old Regulations.

† Including 4 commissions for cadets under the old Regulations.

REPORT.
XII.
Royal Military College.

The Examiner in Military Surveying observes a better appreciation of the forms of ground and of the mode of obtaining its outlines. In the work done during the half year he notes an improvement in the manner of combining surveying processes, although he adds that there is still room for progress in this respect. On the other hand, in the manipulative portion of the work, the examination sketches of this term do not contrast favourably with those made at the two previous examinations; upon the whole, however, improvement is shown by a smaller number of cadets having entirely failed.

In Military History the Examiner states that the majority of the papers are rather below than above average merit, which he attributes in some measure to an evident tendency to give hasty and ill-digested answers, without a careful study of the import of the question. He observes that the cadets who draw the most accurate plans are, as a general rule, the most accurate in their narrative, and the clearest and most intelligent in their reasoning.

The Examiner in French reports an improvement extending over the whole subject, but more particularly noticeable in the translation from French into English and in Grammar.

In German the Examiner states that the present examination shows again a certain improvement in the study of that language, and more particularly in the Grammar.

The Examiner in Experimental Sciences reports that the papers are generally satisfactory, and include several which are highly praiseworthy.

The Examiner in Free-hand Drawing reports the number of good drawings from casts that were executed before him to be highly creditable both to students and teachers. There can be, he states, no doubt of the general steady progress made by the cadets. He adds that it is satisfactory to see that while very few neglect this subject altogether, fewer still of those who take it up fail in acquiring some knowledge of it.

P.S.—Since the above was written the Council have received a report from the Examiner in Geology.

He considers that the answers are decidedly better than those given last year, when the number of candidates was only half as great.

Examination of December 1864.

From the Report of the Examiner in Mathematics it appears that the elementary portions have been on the whole well prepared. There was a considerable amount of failure, however, in Euclid, and there were many failures in the first question of the first paper, through want of knowledge of the table of measures.

The Examiner having noticed on a former occasion some want of neatness and arrangement in many of the papers, now reports such a degree of improvement in these respects as leaves no reason for complaint.

Corporal W. C. F. Molyneux.

The Examiner particularly instances the excellent papers of No. 45.

In Fortification the Examiner reports that the result of the examination is on the whole satisfactory; several of the papers are very good; and he particularly calls attention to those of No. 92.

Corporal R. E. Walpole

The Examiner in French notices some general improvement in the answers to grammatical questions, but reports much deficiency in writing from dictation and in composition.

The Examiner in German reports that a decided improvement has taken place in that study. There were no failures in the translation from German; a fair average of the candidates were able to translate intelligibly from English into German; and the grammatical answers were far better than on former occasions.

The Examiner in Experimental Sciences reports that the general result of the examination in Physics is not of a satisfactory nature, the average character of the papers being considerably inferior to that of the papers sent in at the last examination.

The Examiner in Free-hand Drawing reports that there are few candidates who have not done fairly, considering the short time allowed for this study. There were many very praiseworthy drawings from models, and on the whole the work was in advance of that shown at former examinations.

In Surveying, the Examiner reports that in the survey work of the gentlemen cadets of the Royal Military College the errors pointed out in previous examinations in the Triangulations and Traversing have been corrected generally; but he again calls the attention of the Council to a serious error in principle to be found in the Triangulation work of several of the cadets, accompanied by a general want of appreciation of the methods by which precision is obtained in Traverse Surveying.

Of that portion of the work which consists in the represention of hill forms the Examiner reports very favourably.

The examination sketches, though executed under very unfavourable circumstances—in cold and rain—have amongst them many creditable productions, and several of the sketches executed during the term possess great merit. Gentleman cadet Sir J. L. Foulis, Bart., will become, the Examiner thinks, a very beautiful draughtsman.

The report on the examination in Military History has not yet been received.

Although this examination does not show such excellent results as were observable in that of June last, the Council are able to report to his Royal Highness that upon the whole it may be considered as satisfactory.

It becomes interesting to ascertain to what degree success at the entrance examination is an earnest of success at the final examination for commissions without purchase. The following two Tables, showing the places taken at the entrance examination by cadets who were successful in their final competition, and the subjects in which they distinguished themselves, may afford useful information.

TABLE I.

FINAL EXAMINATION OF JUNE 1863.

Place at Final Examination.	Place of same Candidate at Entrance Examination.	Subjects in which Candidates were distinguished * at the Entrance Examination.									
		Mathematics.	English.	History.	Latin.	Greek.	French.	German.	Natural Sciences.	Experimental Sciences.	Landscape Drawing.
1	11	—	1	1	—	—	—	—	—	—	—
2	2	1	1	—	1	—	1	1	—	—	—
3	4	1	—	—	1	—	—	—	—	1	—
4	1	1	1	—	1	—	1	—	—	—	—
5	13	—	—	1	—	—	1	—	—	1	—
6	18	—	1	—	1	—	—	—	—	—	—
7	36	1	—	—	—	—	—	—	—	—	—
8	25	—	—	—	1	—	—	—	—	—	—
9	6	1	1	—	—	—	1	1	—	—	—
10	16	1	—	—	—	—	—	—	—	1	—
11	40	—	—	—	—	—	—	1	—	—	—
12	10	1	1	1	1	—	—	—	—	—	—
13	3	—	1	1	1	—	1	—	—	—	—
14	23	—	—	—	—	—	—	—	—	—	—
15	32	—	—	—	—	—	—	—	—	—	—
Total		7	7	4	7	—	5	3	—	3	—

* Candidates are here included as "distinguished" in Mathematics who obtained in that subject upwards of 1,500 marks; as "distinguished" in Drawing who obtained upwards of 300 marks; and as "distinguished" in any other subjects who obtained in them upwards of 600 marks.

Thus while eight of the first fifteen on admisssion were also among the first fifteen at the final examination, the remaining seven places in the latter were taken by candidates who were only among the first forty at the entrance examination.

TABLE II.

FINAL EXAMINATION OF DECEMBER 1863.

Place at Final Examination.	Place of same Candidate at Entrance Examination.	Date of Entrance Examination.	Subjects in which the Candidates were distinguished at the Entrance Examination.										
			Mathematics.	English.	History.	Latin.	Greek.	French.	German.	Natural Sciences.	Experimental Sciences.	Geometrical Drawing.	Landscape Drawing.
1	14	Dec. 62	1	—	—	—	—	1	—	—	—	—	—
2	20	„	1	—	—	—	—	1	—	—	1	—	—
3	17	„	1	—	—	—	—	—	—	1	1	—	—
4	5	„	1	—	1	1	—	1	—	—	—	—	1
5	24	„	—	—	1	1	—	1	—	—	—	—	—
6	8	„	1	—	1	1	—	1	—	—	—	—	—
7	2	„	1	—	1	1	—	1	—	—	—	—	—
8	11	„	1	1	1	—	—	1	—	—	—	—	—
9	10	„	1	—	—	1	—	1	—	—	—	—	—
10	21	„	—	—	—	1	—	1	—	—	1	—	—
11	16	„	1	—	—	1	—	1	—	—	1	—	—
12	3	„	1	1	1	1	1	1	—	—	—	—	—
13	9	„	1	—	1	1	—	1	—	—	—	—	—
14	29	June 62	—	—	—	—	—	—	—	—	—	—	—
15	18	Dec. 62	1	—	—	—	—	1	—	—	1	—	—
16	41	„	—	—	—	—	—	1	—	—	1	—	—
17	66	June 62	—	—	—	—	—	—	—	—	—	—	—
18	59	„	—	—	—	—	—	—	—	—	—	—	—
19	28	Dec. 62	1	—	—	—	—	1	1	—	—	—	—
20	1	„	1	—	—	1	1	1	—	—	—	—	—
21	8	June 62	1	—	—	—	—	1	—	—	1	—	—
22	43	„	—	—	—	—	—	—	—	—	—	—	—
23	62	Dec. 62	—	—	—	—	—	—	—	—	—	—	—
24	30	June 62	—	—	—	—	—	—	—	—	1	—	—
25	15	Dec. 62	1	—	1	—	—	1	—	—	—	—	—
26	19	June 62	—	—	1	—	—	—	—	—	—	—	—
27	31	Dec. 62	1	—	—	1	—	1	—	—	—	—	—
28	40	„	1	—	—	—	—	—	—	—	—	—	—
29	30	„	1	—	—	—	—	1	—	—	—	—	—
30	Q.'s Cdet. 9	„	—	—	—	1	—	1	—	—	—	—	—
31	60	June 62	—	—	—	1	—	—	—	—	—	—	—
32	34	Dec. 62	—	—	—	—	—	1	—	—	—	—	—
33	37	„	—	—	—	—	—	1	1	—	—	—	—
34	13	„	1	—	—	—	—	—	—	—	—	—	—
Total			20	2	9	13	2	23	2	1	8	1	1

From the last table it appears that of the 34 candidates who obtained commission without purchase in December 1863, 22 had been among the first 34 candidates at the entrance examination a year before, and four others had taken places at the entrance examination among the first 62 candidates. Further, eight candidates who had passed their entrance examination in June 1862, and who were therefore in their third term, were successful in the competition for commissions without purchase. It is to be remarked that nearly all the last-named cadets took low places on admission to the College.

The above tables show very clearly the advantage of a good education before entering the College, as a means to final success in the competition for commissions without purchase. But at the same time they show how much may be done at the College even by those who do not distinguish themselves at the entrance examination. It is evidently open to any cadet of average ability to win his commission by persistent attention to his studies at the College.

Taking the two examinations together, it appears that of the 49

candidates who were successful in the competition for commissions without purchase in June and December 1863—

27	were distinguished at their admission examination in - - -	Mathematics.
9	„ „	English.
13	„ „	History.
20	„ „	Latin.
2	„ „	Greek.
28	„ „	French.
5	„ „	German.
1	„ „	Natural Sciences.
11	„ „	Experimental Sciences.
0	„ „	Geometrical Drawing.
1	„ „	Landscape Drawing.

The predominant subjects are evidently Mathematics, Latin, and French; next come History, English, and Experimental Sciences. In the other subjects few of the candidates distinguished themselves.

The examinations of 1864 have not yet been similarly analysed; but it is believed that the results would not be dissimilar to the preceding.

XIII.

Examination for Direct Commissions in the Cavalry, Guards, and Line.

Since the date of the last Report of the Council the following has been the scheme of the examination for direct commissions.

Subjects.	Total No. of Marks allotted.	Minimum No. of Marks allowed to count, viz., one-sixth in Subjects not obligatory.	No. of Marks for portions of Subjects which are obligatory.	Minimum No. of Marks allowed to count in obligatory Subjects.
Classics { Latin - -	2,000	333	—	—
Classics { Greek - -	1,600	266	—	—
Mathematics - - -	3,600	—	Arithmetic, Algebra, Euclid, 3 Books 1,200	200 + — = 400
English Language - -	1,200	—	—	200
French, or any other Modern Language - - -	1,200	200	—	—
History, Ancient and Modern, with Geography - -	1,200	200	—	—
Natural Sciences, i.e., Mineralogy and Geology - -	1,200	200	—	—
Experimental Sciences, i.e., Chemistry, Heat, Electricity, and Magnetism -	1,200	200	—	—
Drawing - - -	600	100	—	—

Aggregate of Marks required for Qualification, 1,800.

The results of the examinations that have taken place since the date of the last Report will be seen in the following Table.

Date of Examination.	Number examined.	Qualified.	Unqualified.	Annual percentage of Failures.
1860.				
February -	141	82	59	—
April - -	128	88	40	—
June - -	142	61	81	—
August - -	85	62	23	—
October -	126	94	32	—
	622	387	235	37·7
1861.				
February - -	124	81	43	—
April - -	97	81	16	—
May - -	124	86	38	—
August - -	144	82	62	—
November -	141	96	45	—
	630	426	204	32·3
1862.				
January - -	152	84	68	—
May - -	124	77	47	—
May (again) -	80	56	24	—
August - -	122	81	41	—
	478	298	180	37·6
1863.				
January - -	146	82	64	—
May - -	143	108	35	—
August - -	139	91	48	—
	428	281	147	34·3
1864.				
February -	147	107	40	—
May - -	150	109	41	—
August - -	139	91	48	—
November -	144	111	33	—
	580	418	162	27·9
Examined abroad during the same period - -	71	46	25	35·2
Total during the above period	2,809	1,856	953	33·9

Thus the average amount of failures at the several examinations held during the last five years has been 33·9 per cent. Until the year 1864 a candidate was allowed any number of trials so long as

he was within the regulated limits of age; since that date the number of trials has been restricted to three. The above tables represent, therefore, the re-examination of candidates who have failed, as well as the examinations of those who pass at their first trial.

It is important here to ascertain what are in general the grounds of rejection. From the scheme of the examination before given it will be seen that every candidate is required to obtain, for qualification, 400 marks at least in Elementary Mathematics (of which number at least 200 must be obtained in Arithmetic); he must also obtain at least 200 marks in English; and an aggregate on all his subjects of 1,800 marks. Now, the statistics of the examinations during the year 1864 give the following per-centages of failures due to these several requirements, taken singly or in combination.

	Per-centage of failures.
Failed in Mathematics only - - - -	0
„ English only - - - -	1·23
„ obtaining required aggregate of marks without failing in obligatory subjects	66·66
„ Mathematics and in English - -	0
„ Mathematics and in the aggregate of marks - - - -	18·52
„ English and in the aggregate of marks -	9·88
„ Mathematics, in English, and in the aggregate of marks - - -	3·71
	100

From this it will be seen that the obligatory subjects, taken by themselves, are seldom causes of rejection, and that the great difficulty in the way of candidates of defective education is the obtaining the required aggregate of marks, 66 per cent. of the failures being due to this cause alone, irrespectively of the obligatory subjects, and nearly 99 per cent. of the failures being due to it in combination with one or both of those subjects. By far the greater number of the candidates, therefore, who fail in the examinations for direct commissions, fail because the aggregate of marks they obtain, which it is to be observed represents their general education, is insufficient; and the cases are extremely few in which they are rejected only on account of deficiency in one of the particular subjects which have been made obligatory. As the main object of the examination is to secure that those who are appointed to commissions in the Army shall have received a fair general education, it is satisfactory to note that the practical effect of the examinations is rather to disqualify those who are generally deficient than those who fail in any particular branch of education.

With respect to the several subjects of examination, the following Table will show the per-centage of candidates who were respectively good or excellent, fair, indifferent, or bad; the years selected for analysis being those of the years 1860 and 1864, the extreme years of the period now under review.

Subject.	Numbers taking up each Subject.		Per-centage of the Candidates taking up each Subject whose knowledge was					
			Bad or Indifferent. (*a*)		Fair. (*b*)		Good or Excellent. (*c*).	
	1860.	1864.	1860.	1864.	1860.	1864.	1860.	1864.
Mathematics { Obligatory	620	579	16	6·57	49·5	42·63	34·5	50·8
Mathematics { Voluntary	200	381	65·5	37·27	30·5	32·55	4	30·18
English	620	577	5·3	4·16	85	88·56	9·7	7·28
History	598	555	24·2	30·81	66·7	62·34	9·1	6·85
Latin	443	401	33·41	29·18	44·68	38·65	21·91	32·17
Greek	100	136	51	32·35	32	43·38	17	24·27
French	567	515	19·58	18·25	52·74	62·92	27·68	18·83
German	81	90	30·87	21·11	44·44	45·56	24·69	33·33
Natural Sciences	40	53	45	47·17	37·50	35·85	17·50	16·98
Experimental Sciences	82	104	41·47	36·54	45·12	50·96	13·41	12·50
Drawing	468	365	29·92	41·64	45·73	52·33	24·35	6·03

(*a*) This heading represents generally the per-centage of candidates in each subject whose marks are below the minimum allowed to count towards the aggregate. In the voluntary portion of Mathematics, in which no minimum is imposed, it represents the per-centage of candidates who obtain less than 200 marks.

(*b*) Under this heading are comprised, generally, those whose marks are between the minimum allowed to count and 600. In the obligatory portion of Mathematics, however, it comprises those whose marks are between the minimum and 800, the higher limit being assumed on account of the elementary nature of the subject. In Greek, on the other hand, the candidates are included whose marks are between the minimum allowed to count and 500, the difference being due to the greater difficulty of the subject. In Drawing, the maximum in which is only 600, is here comprised the per-centage of candidates whose marks are between the minimum and 300.

(*c*) Under this heading is comprised the per-centage of candidates whose marks are respectively higher than the numbers stated in the last note (*b*).

The per-centages in the above Table have been obtained, as regards the year 1860, from the results of the examination of 620 candidates, and, with respect to the year 1864, from the results of the examination of 579 candidates. They may, therefore, be accepted as showing with sufficient accuracy the state of education of the candidates for direct commissions at the respective periods. It appears then, from the columns representing the per-centage of candidates whose knowledge was bad or indifferent, that in all the subjects, except History, Natural Sciences, and Landscape Drawing, there has been improvement, and the improvement is very marked in the subjects of Mathematics, Greek, and German. Again, looking at the two last columns, denoting the per-centage of candidates whose knowledge may be considered good, and, in some cases, of a superior order, it appears that in the subjects which form the staple of English education, as Latin, Greek, and Mathematics, there has been a considerable advance; there is also an advance in German; but in the other subjects, viz., English, French, History, the Sciences, and Drawing, there has been a falling off. On the other hand, in English, French, Experimental Science, and Drawing, there is an increase in the number of candidates whose knowledge is ranked as "fair." Upon the whole the acquirements of the candidates, as represented by their marks, show a decided improvement in the Classics, Mathematics, and German, and improvements, although less decided, in Experimental Science. In "English" and in French they are stationary. In History, Natural Science, and Drawing they show rather retrogression than advance.

The above Table shows, further, the influence of these examinations on education, by the numbers taking up the respective subjects at the two periods under consideration. These, when reduced, are as follows, representing by 100 the total number of candidates in each period :—

	1860.	1864.
Mathematics (obligatory portion)	100	100
„ (voluntary portion)	31	65
English (obligatory)	100	100
History	96	96
Latin	71	69
Greek	16	23
French	91	89
German	13	15
Natural Sciences	6	9
Experimental Sciences	13	18
Drawing	75	63

The increase is striking in the numbers who attempt the voluntary portion of Mathematics, that is, who pursue that study beyond the Third Book of Euclid, and Simple Equations in Algebra, being no less than 34 per cent. In Latin there is a falling off of two per cent. but in Greek there is an increase of seven per cent. in the number of candidates, which fact, taken in conjunction with the improvement in the quality of the work before pointed out, must be considered satisfactory as regards that study. The other subjects do not call for any special remark.

In the reprint of the Regulations published in May 1863 a rule was inserted, having for its object to deter unsuccessful candidates from presenting themselves again without due preparation. Candidates who obtained an aggregate of less than 1,500 marks were not to appear again for examination within six months, and those who obtained less than 900 marks were not to appear again within 12 months. This rule had, in fact, been acted upon for several years before, on the recommendation of the Council submitted with the report of each separate examination, but it was at this period made a permanent regulation for these examinations.

In the same year a concession was made to the Universities of Oxford, Cambridge, Dublin, and London, dispensing with further examination in regard to candidates who had taken the degree of Bachelor of Arts at either of those universities. This had also been acted upon from the commencement of these examinations, upon the special recommendation of the Council, and was now made part of the Regulations.

It was in a short time extended so as to include the Universities of Edinburgh, Aberdeen, and St. Andrew's.

The limits of age for the examination for direct commissions were formerly 18—23 years for the Infantry, 18—25 years for the Cavalry, and 18—28 years for Colonial Corps. In January 1864 higher limits were reduced, and the ages now stand as follows :—

For Infantry	18—20 years.
Cavalry	18—22 „
Colonial Corps	18—26 „

XIV.

Examination of Candidates for Appointment to the Commissariat Department.

In April 1860 a scheme which the Council had been called upon to prepare for the examination of candidates for the appointment of Deputy Assistant Commissary General, was approved of by His Royal Highness the Field Marshal Commanding-in-Chief and by the then Secretary of State for War; and a general order on the subject was issued to the army on the 15th June 1860.

The following Table shows the number of candidates examined and passed since that time. Extracts from the general order referred to above, with copies of some of the questions in Book-keeping and Commercial Geography, will be found in Appendix XV.

Year.	Number examined.		Qualified.		Unqualified.	
	Officers.	Civilians.	Officers.	Civilians.	Officers.	Civilians.
1860 -	1	13	—	4	1	9
1861 -	4	30	2	13	2	17
1862 -	4	34	3	18	1	16
1863 -	3	2	3	—	—	2
1864 -	7	—	6	—	1	—

In concluding this Report the Council are gratified at being able to call the attention of His Royal Highness the Field Marshal Commanding-in-Chief, and of the Secretary of State for War, to the state of progress which it indicates. It is not an improbable supposition that this progress will be still more marked, when the public and other schools shall have adopted those recommendations of the Royal Commissioners with respect to the requirements of modern education, which have been quoted in the foregoing Report.

The Army examinations, which even now are based as far as possible upon the general education of the country, will then be in entire conformity with it, and will more fully be to one class of young men what University examinations have long been to another, incentives to further progress.

But whether this expectation be fulfilled or not, the Council believe that an important advance has already been made, and that the public service will not fail to reap the benefit of the measures that have been adopted for the education of the Officers of the Army.

Fred. Wm. Hamilton, Major-General, V.P.
F. Abbott, Major-General.
Henry Moseley.
T. Elwyn, Colonel.
J. E. Addison, Colonel.

29th December 1864.

APPENDIX.

Appendix I.

List of Professors and Masters appointed to the Royal Military Academy, the Advanced Class of Officers of Artillery, the Royal Military College, and the Staff College, since 31st March 1860.

When appointed.	Professor, Master, &c.	Name.	College.	Remarks.
July 1860	Professor of Mechanics -	Mr. T. Goodeve - -	R. M. Academy	—
„ „	Instructor, Military Drawing.	Captain W. Paterson -	R. M. College.	—
Dec. „	Lecturer on Chemistry -	Mr. G. D. Liveing - -	„	—
Feb. 1861	Instructor in Surveying	Captain G. A. Crawford, R.A.	R. M. Academy	—
Aug. „	Drawing Master -	Mr. F. A. Bradley - -	„	—
„ „	„ „ - -	Mr. A. Penley - - -	„	—
„ „	„ „ - -	Mr. J. Callow - -	„	—
„ „	Professor of Hindustani	Major R. Robertson -	„	—
„ „	Hindustani Master -	Mr. C. Mather - -	„	—
Sept. „	Master, Geometrical Drawing.	Mr. G. B. Moore - -	„	—
Oct. „	Instructor in Surveying	Captain C. E. Webber, R.E.	„	—
„ „	Instructor in Fortification.	Brevet-Major W. J. Stuart, R.E.	„	—
„ „	„ „	Captain J. E. Cornes, R.E. -	„	—
Jan. 1862	„ „	„ J. Smith, R.E. -	„	—
Feb. „	Mathematical Master -	Mr. T. Savage - -	R. M. College.	—
„ „	Instructor in Fortification.	Captain L. A. Hale, R.E. -	„	—
„ „	Lecturer in Chemistry -	Dr. E. Atkinson - -	„	—
Mar. „	Professor of German -	Dr. C. H. Schaible - -	R. M. Academy.	—
„ „	Instructor in Surveying and Plan Drawing.	Captain A. H. Hutchinson, R.A.	„	—
May „	Professor of Geology, &c.	Mr. R. Jones - -	R. M. College and Staff College.	—
July „	Mathematical Master -	Mr. W. Rae ster - -	R. M. Academy.	Re-appointed.
Sept. „	Instructor in Fortification.	Major W. Porter, R.E. -	R. M. College.	—
„ „	Ditto - - -	Captain H. Cardew, R.A. -	„	—
„ „	Instructor in Military Drawing and Surveying.	„ W. H. Richards, 55th	„	—
Oct. „	„ „	„ E. A. Anderson, 18th	„	—
„ „	Drawing Master - -	Mr. R. Harley - -	„	—
Feb. 1863	Mathematical Master -	Mr. T. Savage - -	Staff College.	From R. M. College.
„ „	„ „	Mr. J. P. Ketley - -	R. M. College.	—
April „	German Master - -	Dr. Althaus - - -	R. M. Academy.	—
July „	Professor of German -	Dr. Overbeck - - -	Staff College.	—
Aug. „	Instructor in Artillery -	Captain O. H. Goodenough, R.A.	R. M. Academy.	—
Oct. „	„ „	Captain H. W. Briscoe, R.A.	„	—
Jan. 1864	Mathematical Master -	Mr. M. W. Crofton - -	„	—
Feb. „	Instructor in Military History.	Lieut. O. W. de Thoren, 45th	R. M. College.	—
Mar. „	Assistant Instructor in Artillery.	Captain Pasley, R.A. -	R. M. Academy.	—
May „	Assistant Inspector of Studies.	„ E. J. Bruce - -	„	—
June „	Professor of Fortification and Artillery.	„ H. Schaw, R.E. -	Staff College.	—
July „	Professor of Military History.	„ C. C. Chesney, R.E.	„	From R. M. College.
„ „	Ditto - - - -	Major C. Adams - -	R. M. College.	—
„ „	Instructor in Artillery -	Lieut. H. Brackenbury, R.A.	R. M. Academy.	—
Aug. „	Instructor in Military History.	Captain E. Walker, R.E. -	R. M. College.	—

App. II.

Staff Appointments.

Advanced Class.

When appointed.	Professor, &c.	Name.	Remarks.
April 1863	Director	Major C. F. Young, R.A.	
Dec. 1863	Professor of Mathematics	Rev. F. Bashforth.	
Dec. 1863	Assistant Director	Captain Brackenbury.	
Mar. 1864	Lecturer in Chemistry	Mr. C. Bloxam.	
Mar. 1864	Laboratory Assistant	Mr. Charles.	
May 1864	Lecturer on Mechanics	Mr. Anderson.	
May 1864	Lecturer on Metallurgy	Dr. Percy.	
Sept. 1864	Lecturer on Practical Mechanics and Physics.	Mr. Goodeve.	

Appendix II.

List of Officers who have passed their Examination for Direct Staff Appointments since the Date of the last Report.

Rank.	Name.	Corps.	Date of Examination.	Nature of Appointment.
Captain	Hardy	84th Foot	May 1860	A.D.C.
Lieutenant	Lord Garlies	Royal Horse Guards	May „	„
Captain	De Winton	Royal Artillery	June „	„
„	Hill	30th Foot	July „	„
„	Trent	26th Foot	Aug. „	„
„	Nicolls	Royal Artillery	Sept. „	„
„	Macdonald	5th Foot	Nov. „	Assistant Military Secretary.
„	Pemberton	Scots Fusileer Guards	Nov. „	A.D.C.
„	Bowden	„ „	Mar. 1861	„
Lieutenant	Dalzell	„ „	April „	„
Captain	Hon. C. C. Chetwynd	Unattached	June „	„
„	„ J. C. Stanley	Grenadier Guards	July „	„
„	„ P. H. de Montmorency.	33d Foot	Aug. „	„
Lieutenant	Charles Fludyer	Grenadier Guards	Aug. „	„
„	B. Hall	Royal Artillery	Aug. „	„
Captain	G. G. Gordon	Scots Fusileer Guards	Aug. „	Brigade-major.
Lieutenant	G. J. H. Pearson	15th Hussars	Aug. „	A.D.C.
„	W. F. M. Hutchinson	Royal Artillery	Nov. „	„
Captain	F. F. Hamilton	4th Foot	Nov. „	„
Lieutenant	Moorsom	Rifle Brigade	Jan. 1862	„
„	Drummond	„	Jan. „	„
„	M. P. Battye	10th Foot	Jan. „	„
„	T. Van Straubenzee	Royal Artillery	Feb. „	„
„	Muir Mackenzie	„	Feb. „	„
Captain	Philip Smith	Grenadier Guards	May „	Brigade-major.
„	A. Templeman	21st Foot	July „	A.D.C.
Lieutenant	E. A. Wood	10th Hussars	Aug. „	„
Captain	J. Keith Fraser	1st Life Guards	Sept. „	„
„	A. C. Bogle	10th Foot	Oct. „	„
Lieutenant	St. J. C. Paulet	5th Dragoon Guards	June 1863	„
Captain	W. P. Gaskell	24th Foot	Aug. „	„
„	Hon. J. D. Drummond	11th Hussars	Sept. „	„
„	R. De Grey Vyner	Grenadier Guards	Sept. „	„
Lieutenant	C. H. Boileau	61st Foot	Oct. „	„
„	R. H. O. G. Haly	84th Foot	Oct. „	„
„	S. Saunderson	11th Hussars	Dec. „	„
Captain	H. M. Beresford	9th Foot	Jan. 1864	„
Lieutenant	D. H. Doherty	3d Hussars	Jan. „	„
„	H. W. Byng	41st Foot	Mar. „	„
Captain	Hon. C. G. C. Eliot	Grenadier Guards	June „	„
Lieutenant	C. C. Richardson	70th Foot	July „	„
„	H. G. Thomson	1st Foot	Aug. „	„
Captain	Williams	Royal Artillery	Nov. „	„
Lieutenant	Wilson	„	Nov. „	„

Appendix III.

No. 855.

General Order.

Horse Guards, S.W.
21st October, 1864.

Staff College.
8—(1864.)

The accompanying Regulations for the Staff College, having been revised, are now promulgated, for the information and guidance of Officers of the Army.

All applications to study at the Staff College must be made whilst the officer making it is present and serving with his regiment, through the Commanding Officer. No application from an officer on leave will be entertained.

Although only one officer can be spared from a battalion at a time, for the purpose of studying at the College, this will not, necessarily, prevent a battalion sending more than one to compete at an examination, if circumstances admit of their absence from their regiment.

The principle under which officers are allowed to enter the Staff College being that of pure competion, it follows that candidates who may be found qualified at any examination, but who, from want of a sufficient number of vacancies, cannot then be admitted, will not have any claim to subsequent admission, without undergoing another competitive examination.

It is hereby notified that, until further orders, Art. XIII. is suspended.

By order of His Royal Highness
The Field Marshal Commanding-in-Chief;
James Yorke Scarlett,
Adjutant-General.

Staff College.

Horse Guards, S.W.,
25th August, 1863.

The following Regulations for the Staff College are substituted for those of the memorandum of the 6th March 1862, published with the General Order No. 808.

I. The Staff College is open to officers of all arms of the service, and consists, at present, of 30 students; admission to the College being determined by a competitive examination. One officer only can be admitted at a time from a battalion of infantry, or a regiment of cavalry, and only four officers at a time from the corps of royal artillery; but so far as the exigencies of the service shall permit, there will be no limitation to the numbers allowed to compete for admission.

II. No payment is required from students to the funds of the College.

III. The qualifications requisite for admission, are—

1st. A previous service of not less than three years, exclusive of leave of absence.

2d. A certificate from his Commanding Officer, as follows:—

"I hereby certify that I have examined _____
" on the various subjects connected with his duty as a regimental officer, and
" more especially on the points which form the chief qualifications of a staff
" officer, with a view to his competency for admission to the Staff College,
" Sandhurst; and to the best of my belief and judgment I consider him, from
" his general knowledge of the service, character, habits, and disposition, to be
" qualified for employment on the staff, provided he pass the usual competitive
" examination for admission to the Staff College.
" He is a (good, fair, or indifferent) rider, and is not short-sighted."

Signature of commanding officer of regiment. } _____

Countersigned by the general of brigade, or other superior officer. } _____

3d. The candidate, if not a captain, to have passed the examination for a troop or company.

4th. A medical certificate of good health, and fitness for the active duties of the staff.

IV. Commanding Officers of regiments will, in every case, forward applications for admission to the Staff College, through the General Officer in command, to the Adjutant-General. If the Commanding Officer of the regiment, or the General Officer commanding, cannot recommend the application of any candidate, the grounds of objection to be distinctly stated.

V. The competitive examination for entrance to the Staff College comprises the following subjects, the relative value of each at the examination being shown by the number of marks attached to it:

	Marks.
Mathematics	1,200
Military History 600 Military Geography 300	900
French	300
German	300
Hindustani	300
Fortification	600
Military Drawing	300
Mineralogy and Geology	300
Chemistry, Heat, Electricity, and Magnetism	300

In Mathematics, 400 marks are allotted to Arithmetic, the first four books of Euclid, and Algebra, including questions producing simple equations; and of this number at least 250 must be obtained for qualification.

Every candidate must take up either the French, German, or Hindustani language for qualification; the qualifying minimum is, in French 150 marks, in German or Hindustani 100 marks.

The remaining subjects, as well as the higher portions of Mathematics, may be taken up or not, at the option of the candidate; the marks gained therein being reckoned in determining his position in the lists of competitors. No candidate, however, will be allowed to count marks in any subject left optional unless he obtains at least one sixth of the number allotted to it.

In regard to Military History, early notice will on each occasion be given of the special campaigns on which questions will be set at the next ensuing examination.

VI. The examination of officers serving in the United Kingdom for entrance to the Staff College is held in London, about the month of July, under the direction of the Council of Military Education.

In the case of officers serving abroad, the examinations of such as are allowed to compete are conducted by means of the same printed questions as are set for the examination of candidates in London. These questions are to be answered in writing in the presence of a board of officers, which will be appointed by the General Officer in command, and which will certify that the candidate has obtained no assistance from books, or help of any kind in the examination.

VII. The College Course of Study commences annually on or about the 1st February. The transmission of the printed examination papers to stations abroad is so arranged that the examinations may be held simultaneously, and the merits of the candidates decided upon in time to admit of those who are successful joining the Staff College by the 1st February next ensuing.

VIII. The following are the subjects of instruction at the Staff College, viz.* :—

Mathematics. The minimum course will embrace this subject up to Elementary Mechanics, inclusive.
French, German, and Hindustani.
Fortification and Artillery.
Topographical Drawing, Military Surveying, and Sketching.
Reconnaissance.
Military Art, Military History, and Geography.
Military Administration, including the organization and equipment of armies in the field.
Military Legislation.

* A syllabus of the course of study will be forwarded to any officer on application to the Council of Military Education, 13, Great George Street, S.W.

Elements of Natural Philosophy, Chemistry, and Geology, as applied to the Military Sciences.

Exercise in Composition will be afforded to the students during the whole course of instruction, in writing Memoirs or Essays on the subjects of the course.

Riding.

IX. The course of study occupies two years, which period is not to be exceeded except in case of illness, and then only with the sanction of the Field Marshal Commanding-in-Chief.

The yearly course is divided into two terms, viz., from 1st February to 15th June, and from the 15th July to the 15th December, the intervening periods constituting the vacations.

X. As officers may be expected to join the College with very varied degrees of attainment, provision will be made to enable any student who may be well prepared in any particular subject, to attend more especially to other subjects in which he may feel himself deficient. If, for instance, the student should come to the College previously well instructed in Mathematics, he will be enabled to direct his attention principally to the Military Sciences, or to Languages, in lieu of mathematical studies.

XI. During the whole course, Monthly Reports of the application and progress of each student will be forwarded for the information of the Council of Military Education. Examinations are held at the end of every half-year; the Summer Examination being conducted by the Professors of the College, and the Winter Examination by Examiners independent of the establishment, under the superintendence of the Council of Military Education.

The Winter Examination at the termination of the first year of the student's course is probationary, and any student will be required to withdraw from the College who shall fail to obtain the minimum aggregate of marks herein-after stated.

Should, however, any marked case of deficiency or neglect be brought under the notice of the Council of Military Education at any half-yearly examination, or at any other period, such student will be also liable to removal.

The four following subjects will be taken up by every student at the Probationary Examination; viz.:—

	Maximum of Marks.	Minimum of Marks allowed to count.
Fortification	450	150
Military Drawing and Surveying	300	100
Military History	450	150
Military Administration and Legislation	450	150

Of the following subjects the student may select any three, one of which must be a Language.

Mathematics:—	Maximum of Marks.
First Year's Course, viz.:—	
Geometry, commencing with Euclid, B. VI.	300
Plane Trigonometry and Mensuration	
Algebra, commencing with Quadratic Equations	
Spherical Trigonometry and Practical* Astronomy	200
French	400
German	400
Hindustani	400
Any one Modern Language, provided one of the above be also taken up	400
Natural Sciences	400
Experimental ditto	400

Every candidate will be expected to obtain a minimum aggregate of 1,400 marks.

Any officer who does not take up Mathematics as a subject, will be required to satisfy the Examiner that he has a competent knowledge of Mensuration, and of the mode of determining heights and distances by ground problems,

* It is optional to the student whether he take up this subject at the probationary or at the final examination.

and by the ordinary trigonometrical calculations, with the aid of logarithms; and that he is so far acquainted with Elementary Mechanics as is necessary for understanding the principles of the construction of military bridges, dams, &c. &c. His knowledge of these subjects will be tested at the Probationary Examination at the end of his first year of residence.

XII. The following are the marks allotted to each subject at the Final Examination :—

Subjects to be taken up by every student :—

	Maximum No. of Marks.	Minimum allowed to count.
Fortification and Artillery	600	300
Military Drawing and Surveying	350	(Obligatory.)
Reconnaissance	350	350
Military Art, History, and Geography	600	300
Military Administration and Legislation	600	300

Subjects, of which the student may select any three, one of which must be a Language :—

		Maximum of Marks.
First Year's Course (Marks carried forward)	300	900
Spherical Trigonometry and Practical Astronomy (Marks carried forward, if taken up at the Probationary Examination)	200	
Problems of Heights and Distances, Mechanics, and Hydrostatics	400	
French		400
German		400
Hindustani		400
Any one Modern Language, provided one of the above be also taken up		400
Natural Sciences		400
Experimental do.		400

Every candidate will be required to obtain for qualification 350 marks in Military Drawing, Surveying, and Reconnaissance; and an aggregate of 2,500 marks.

In the examination in Modern Languages great stress will be laid on original Composition.

Officers desirous of showing their proficiency in other of the Optional Subjects, in addition to the *three* which are allowed to be taken up for the competitive examination, may be examined therein, and a Special Report of their qualifications will be made to the Field Marshal Commanding-in-Chief, but they will not be allowed to count any marks thus gained in determining their position in the order of merit.

XIII. Any officer may, with the sanction of the Field Marshal Commanding-in-Chief, compete at the Annual Final Examination without previously passing through the College; and further, any officer who desires to enter the College for one year only will be permitted, if there be a vacancy, to present himself at the First Annual Examination of the Junior Division of Students (who will then have completed their first year), and if qualified may join the College accordingly. In each case the qualifications noted in paragraph III. (above) will be required. Any officer at the College, although of the Junior Division, may compete at the Final Examination of the Senior Division.

An officer desiring to compete at the Final Examination should give not less than a year's notice of his intention, in order that he may receive a detailed statement of the subjects in which he, in common with the students of the Staff College, will be examined. To count his full marks, he will be required to produce the same number of Plans, and of Memoirs in Military History, as are prepared by the students of the Staff College, certifying that they are his own unaided work, and that they were executed within the two years immediately preceding the examination. If his application to compete be granted by the Field Marshal Commanding-in-Chief, he will be required to attend at the College during the first three months of the term commencing the 15th July, in order that he may have the opportunity of executing the same Surveys,

Reconnaissances, and projects of Field Fortification, as are executed by the regular Students.

An officer desiring to compete at the Probationary Examination for admission to the College for a residence of one year only, consequent on the occurrence of a vacancy in the Junior Divison, will be required to give six months notice of his intention, in order that he, in like manner, may receive a detailed statement of the subjects in which he will be examined and of the Plans and Memoirs which he will be required to produce, in common with the students of the then Junior Division. On receiving permission from the Field Marshal Commanding-in-Chief to compete, he will be directed to attend at the College during the first three months of the term commencing the 15th July, in order to have the opportunity of executing the same sketches and surveys as are executed by the students.

No officer will be allowed to present himself at either of these examinations who shall have been examined during the same year for admission to the College for the ordinary period of residence.

Either or both of these examinations will be liable to be suspended whenever it shall appear that the supply of officers from the College is sufficient to meet the requirements for the Staff of the Army.

XIV. After the Final Examination the Council of Military Education will draw up, and submit for the consideration of the Field Marshal Commanding-in-Chief, a list of the successful candidates, arranged according to merit, with a special report of those who particularly distinguished themselves, whose names will be also mentioned by the Council in their Report.

XV. Officers who have passed their Final Examination at the Staff College will be attached to other Arms of the Service for the purpose of acquiring instruction in those duties and field movements which are not common to their own. Certificates of their efficiency therein will be forwarded to the Adjutant-General by the officers commanding the corps to which they have been attached.

Officers of Cavalry and Infantry will attend at Woolwich, or such other station as may be ordered for instruction in Artillery, for a period of six weeks.

Officers of Cavalry will be attached to Infantry for one month.

Officers of Artillery, Horse Artillery excepted, will be attached to Cavalry for one month, and Officers of Infantry for six weeks.

Officers of Artillery will not be required to be attached to Infantry.

XVI. The Regulations relative to the qualifications of officers for direct Staff Appointments will continue in force until the system which has been above detailed shall have fully come into operation, and the examinations referred to in that order will be conducted under the direction of the Council of Military Education.

Officers, however, who have attained the rank of Lieutenant-Colonel will be exempted from the operation of that order.

As soon as the College shall be in a position to supply all vacancies in the Staff of the Army, no officer will be appointed to the Staff who shall not have passed the Final Examination of the College, with the exception of those of the Royal Engineers, and of those who attained before the 1st January 1860, the rank of Lieutenant-Colonel, and in every case excepting officers of proved ability in the field.

XVII. Although the course of Mathematics at the College has been limited to that amount of knowledge which is considered essential to complete the education of the Staff Officer, it is probable that many officers may desire to pursue their Mathematical Studies to a much higher point; and any candidates, therefore, who shall have proved their fitness for employment on the Ordnance Survey, or in the Topographical Department, by superior progress in the Science of Geodesy, as well as of Topography, will be named in the Report of the Council of Military Education as deserving of employment in those Services.

JAMES YORKE SCARLETT,
Adjutant-General.

Appendix IV.

Examination of Officers, Candidates for Admission to the Staff College.

August 1860.

Order.	Rank and Name.	Corps.	Index No.	Marks.	Remarks.
1	Capt. T. D. Baker	2d Bn. 18th Foot	131	2,884	Recommended.
2	„ W. K. Ellis	38th Foot	7	2,800	Do.
3	Lieut. J. P. Nolan	Royal Artillery	1,555	2,726	Do.
4	„ J. T. Barrington	Do.	140	2,534	Do.
5	Bt.-Major E. C. Bolton	Do.	130	2,288	Qualified, but there is no vacancy for another officer of the R. A. or R. E.
6	Lieut. E. Mitchell	Royal Engineers	21	2,287	
7	„ A. G. F. Griffiths	63d Foot	139	2,199	Recommended.
8	„ W. H. Wardell	Royal Artillery	135	2,145	Qualified, but there is no vacancy for another officer of the R. A.
9	„ A. Murphy	5th Lancers	35	2,118	Recommended.
10	„ C. J. East	82d Foot	65	2,104	Do.
11	Capt. W. Black	6th Foot	133	2,022	Do.
12	„ C. K. Parsons	2d Bn. 3d Foot	1,001	2,009	Do.
13	Lieut. W. L. K. Ogilvy	4th Bn. 60th Rifles	134	1,937	Do.
14	Capt. C. Acton	51st Foot	132	1,906	Do.
15	Lieut. T. Gonne	17th Lancers	62	1,796	Do.
16	Capt. C. D. C. Ellis	1st Bn. 60th Rifles	63	1,759	Do.
17	„ W. W. Lynch	2d Bn. 2d Foot	38	1,702	Do.
18	„ H. Nangle	1st Bn. 15th Foot	136	1,700	Do.
19	„ G. A. Wilkinson	Royal Artillery	138	1,697	
20	Lieut. A. L. Emerson	28th Foot	36	1,689	
21	„ A. H. Bell	Royal Artillery	141	1,668	
22	„ C. R. Johnstone	50th Foot	1	1,647	Qualified, but there are no further vacancies.
23	Capt. R. Harbord	7th Foot	42	1,602	
24	Bt. Major G. N. Fendall	53d Foot	66	1,305	
25	Capt. G. C. S. Lombard	2d Bn. 16th Foot	41	1,221	
26	„ H. De R. Pigott	83d Foot	63	933	
			137	1,221	Failed in Modern Languages.
			29	1,192	
			69	1,084	
			72	701	Failed in Mathematics and in Modern Languages.
			71	598	
			75	483	

July 1861.

Order.	Rank and Name.	Corps.	Index No.	Marks.	Remarks.
1	Lieut. H. M. Hozier	Royal Artillery	130	2,785	Recommended.
2	„ C. E. Edwards	Rifle Brigade	35	2,645	Do.
3	Capt. G. P. Colley	2d Bn. 2d Foot	1	2,514	Do.
4	„ H. Bonham-Carter	Coldstream Gds.	141	2,497	Do.
5	„ J. H. St. John	20th Foot	138	2,337	Do.
6	Major J. W. Lawrie	Unattached	32	2,315	Do.
7	Capt F. T. Law	Royal Artillery	9	2,162	Do.
8	Major H. Arbuthnot	Do.	56	2,083	No vacancy for another officer of the R. A.
9	Lieut. E. Deshon	68th Foot	133	2,065	Since retired from the service.
10	„ J. J. N. Buchanan	6th Dragoon Gds.	145	1,951	Recommended.
11	„ A. S. Adair	13th Foot	71	1,924	Do.
12	„ G. G. Beasley	83d Foot	242	1,922	Do.
13	Capt. R. Harbord	7th Foot	41	1,883	Do.
14	Lieut. F. H. Dodson	Royal Artillery	62	1,800	No vacancy for another officer of the R. A.
15	Capt. E. G. Horne	25th Foot	59	1,745	Recommended.
16	Lieut.		139	1,716	Ineligible, Certificates being unsatisfactory.
17	„ A. L. Emerson	28th Foot	132	1,670	Recommended.
18	„ H. A. Brett	43d Foot	34	1,647	Do.
19	Capt. R. C. Healy	16th Foot	47	1,639	Do.
20	„ G. E. Francis	20th Foot	825	1,507	
21	„ J. C. Ross Grove	42d Foot	68	1,436	
22	„ J. G. Image	21st Foot	39	1,392	Qualified for admission, but there is no further vacancy.
23	„ A. W. Hall	58th Foot	142	1,011	
24	„ J. Bond	93d Foot	147	882	
25	Lieut. H. Bishop	89th Foot	44	584	
			750	2,069	Failed in Modern Languages.
			33	1,387	Failed in Mathematics.
			136	1,383	Failed in Modern Languages.
			144	1,354	Failed in Mathematics.
			65	1,136	Failed in Modern Languages.
			135	852	Failed in Mathematics.
			30	673	Do.

Examinations of Officers, Candidates for admission to the Staff College.

July 1862.

Order.	Rank and Name.	Corps.	Station.	Index No.	Marks.	Remarks.
1	Major W. H. Goodenough	Royal Artillery	Home	2	2,766	Recommended.
2	Capt. F. J. Hutchison	64th Regiment	„	12	2,540	
3	Bt.-Major G. D. Barker	64th Regiment	„	9	2,509	Qualified, but there is no vacancy for another officer of the 64th Regiment.
4	Capt. G. Creagh	1st Bn. 5th Regt.	„	6	2,468	
5	Lieut. L. J. Blake	2d Bn. 5th Regt.	„	7	2,440	
6	„ and Capt. E. Clive	Grenadier Guards	„	13	2,148	
7	„ H. B. H. Blundell	1st Bn. Rifle Brig.	Canada	247	2,070	
8	„ W. Arbuthnot	14th Hussars	Home	14	2,060	
9	„ C. B. Knowles	77th Regiment	„	3	2,052	
10	Major W. J. Bolton	Royal Artillery	„	11	2,017	Recommended.
11	Bt.-Major E. Bowen	69th Regiment	„	1	1,919	
12	Lieut. H. W. Young	17th Lancers	„	18	1,904	
13	Capt. H. E. Wood	73d Regiment	„	19	1,903	
14	Lieut. J. H. Fawcett	1st Bn. 1st Regt.	„	10	1,809	
15	„ G. J. Gilbard	16th Lancers	„	4	1,721	
16	„ W. Shaw	Military Train	„	17	1,429	
17	„ H. C. Deane	2d Bn. 17th Regt.	„	15	1,417	Qualified, but there are no further vacancies.
				5	1,335	
				16	1,124	
				144	978	Failed in Mathematics.
				8	902	
				37	634	
				20	118	Failed in Mathematics, and in Modern Languages.

July 1863.

Order.	Rank and Name.	Corps.	Station.	Index No.	Marks.	Remarks.
1	Lieut. J. G. Ridout	100th Foot	Gibraltar	240	2,699	
2	„ A. W. Duncan	Royal Artillery	Home	147	2,475	
3	Capt. C. W. Willis	33d Foot	„	39	2,439	
4	Lieut. C. W. Robinson	2d Bn. Rifle Brig.	„	136	2,425	Recommended.
5	„ H. G. M'Gregor	1st Bn. 17th	„	60	2,383	
6	Capt. R. J. Maxwell	80th Foot	„	63	2,348	
7	„ A.W.J.Montgomerie	20th Hussars	Bengal	153	2,337	Recommended provisionally pending reference to India.
8	„ R. V. Dickens	2d Bn. 11th Foot	Home	144	2,178	Recommended.
9	Lieut. A. G. Wynen	2d Bn. 13th Foot	Mauritius	94	2,044	Recommended provisionally pending reference to the Mauritius.
10	„ Henry Knollys	Royal Artillery	Canada	217	1,981	
11	Capt. C. C. FitzRoy	68th Foot	Home	42	1,963	Recommended.
12	Lieut. A. W. Peyton	3d Buffs	„	141	1,840	
13	Lieut.-Col. H. Peel Yates	Royal Artillery	„	45	1,754	Qualified, but there is no vacancy for a third officer of the R. A.
14	Lieut. G. Fox Grant	62d Foot	„	69	1,731	Recommended.
15	„ G. U. Prior	100th Foot	Gibraltar	241	1,636	Qualified, but there is no vacancy for a second officer of the 100th Foot.
16	„ J. W. Shawe	97th Foot	Home	145	1,553	Recommended.
17	Capt. G. W. Clutterbuck	63d Foot	Canada	216	1,553	
18	Lieut. W. J. E. Poole	2d Bn. 60th Foot	Home	133	1,423	
19	„ L. A. Gregson	26th Foot	„	66	1,422	
20	„ H. C. Deane	2d Bn. 17th Foot	Halifax	228	1,409	Qualified, but there is no vacancy.
21	Capt. R. Blundell	3d Hussars	Home	48	1,157	
22	„ F. S. Herries	65th Foot	„	36	1,081	
				138	1,121	Failed in Mathematics.
				229	1,055	Failed in Modern Languages.
				139	585	Failed in Mathematics and Modern Languages.
				57	441	Failed in Mathematics.

Examination of Officers, Candidates for admission to the Staff College—*cont.*

July 1864.

Order.	Rank and Name.	Corps.	Station.	Index No.	Marks.	Remarks.
1	Bt.-Major G. D. Barker	64th Foot	Home	141	2,825	Recommended.
2	2d Captain J. R. Oliver	R. H. A.	Bengal	100	2,760	Recommended, provided he produces the necessary certificates.
3	Capt. H. Lock	108th Foot	Home	57	2,589	
4	Lieut. C. D. P. Smith	Royal Artillery	Gibraltar	167	2,570	
5	Capt. H. D'O. Farrington	73d Foot	Home	42	2,128	
6	Capt. W. W. Knollys	93d Foot	„	136	2,097	
7	Bt.-Maj. F. D. Middleton	29th Foot	„	144	2,029	
8	Lieut. H. C. Deane	2d Bn. 17th Foot	„	63	1,807	Recommended.
9	„ W. J. E. Poole	2d Bn. 60th Foot	„	45	1,765	
10	„ L. A. Gregson	26th Foot	„	66	1,759	
11	Capt. R. Blundell	3d Hussars	„	48	1,753	
12	„ V. Tonnochy	81st Foot	„	139	1,702	
13	Lieut. W. C. Hood	2d Bn. 2d Foot	„	69	1,700	
14	Capt. G. W. F. D. Smith	29th Foot	„	138	1,696	Recommended pending the decision of His Royal Highness on an application made by this officer to exchange into another Regiment.
15	„ A. H. D. De Vismes	Royal Artillery	„	142	1,574	Qualified, but there are no further vacancies.
16	„ W. Madan	49th Foot	„	72	1,515	
17	„ E. W. Kent	2d Bn. 24th Foot	„	147	1,508	
				166	2,087	
				135	1,792	
				33	1,681	Failed in Modern Languages.
				60	1,572	
				145	1,428	
				133	1,376	
				39	1,307	Failed in Mathematics.
				36	1,241	Failed in Modern Languages.
				72 M	1,221	
—	*Lieut. G. Hatchell	60th Rifles	Burmah	—	1,590	Recommended.

* This officer competed in 1863, and would have stood 14th on the list of that year; but, owing to the delay caused by his being stationed in Burmah, his admission to the Staff College was deferred until February 1865.

Appendix V.

Examination Papers for Admission to the Staff College, July 1864.

Mathematics.—Rev. W. N. Griffin, M.A.

First Paper.—Arithmetic.

1. Find the cost of 18 tons 3 qrs. 16 lbs. at $7\frac{1}{2}d.$ per lb.

2. If 3*l.* 16*s.* 6*d.* is the cost of carrying 34 cwt. 30 miles, what weight can be carried 20 miles for 12 shillings?

3. Convert 2 qrs. 8 lbs. Avoirdupois into Troy weight.

4. What is the cost of tiling a floor 18 yards long by 3 feet 3 inches wide, at 8*d.* the square foot?

5. Add $\frac{3}{4}$ of $\frac{5}{6}$ to $3\frac{1}{2}$, and from the sum take away $2\frac{1}{3}$ of $\frac{1}{2}$ of $3\frac{1}{7}$.

6. A gentleman sells $\frac{4}{9}$ of his estate, and subsequently he sells for 2,382*l.* $\frac{2}{7}$ of the remainder. What is the value, at the same rate, of the portion which he finally retains?

7. Reduce 5 furlongs 66 yards to the decimal of a mile.

8. Multiply ·003 by ·0006, and divide the result by ·00000009.

9. Find the amount of 2,250*l.* in $3\frac{1}{2}$ years at 2*l.* 13*s.* 4*d.* per cent. per annum, simple interest.

10. Divide the recurring decimal ·0777 .... by the recurring decimal ·353535 .....

11. Extract the square root of ·7 to three places of decimals, and find the excess of the square of the result presented over ·7.

MATHEMATICS.—Rev. W. N. GRIFFIN, M.A.

Second Paper.—Algebra.

1. Multiply $a^3-ab+b^2+(a+b+c)c$ by $a+b-c$.
2. Divide $4a^6-25a^2+20a-4$ by $2a^3-5a+2$.
3. Multiply together the four quantities
$$2x-3y, \quad 3x-2y, \quad 2x+3y, \quad 3x+2y.$$
4. Reduce these fractions to their lowest terms:—
$$(1) \quad \frac{x^3-6x^2+11x-6}{x^3+4x^2+x-6}.$$
$$(2) \quad \frac{4x^2-y^2}{4x^6-9x^4y^2+6x^2y^4-y^6}.$$
5. Find the least common multiple of
$$a^3+a^2b+b^2+ab \text{ and } a^4-b^2.$$
6. Solve the equations
$$(1) \quad \frac{4x+3}{9}=\frac{8x+19}{18}-\frac{7x-29}{5x-12}.$$
$$(2) \quad \frac{x}{x-2}+\frac{x-9}{x-7}=\frac{x+1}{x-1}+\frac{x-8}{x-6}.$$
$$(3) \begin{cases} \frac{x+11}{10}+\frac{y-4}{6}=x-7, \\ \frac{x+5}{7}-\frac{y-7}{3}=3y-x. \end{cases}$$

7. Find two numbers in the ratio of 7 and 11, such that, if 18 be taken from one and added to the other, the results are equal.

8. A gentleman finds that he reaches home in the same time travelling from London, whether he takes an express train travelling 30 miles an hour to a principal station 3 miles from his house, or takes an ordinary train travelling 24 miles an hour to a station 4 miles further from London but only 2 miles from his house. He walks 3 miles an hour. Find the distances of the two stations from London.

MATHEMATICS.—Rev. W. N. GRIFFIN, M.A.

Third Paper.—Euclid.

1. If from the ends of the side of a triangle two straight lines be drawn to a point within the triangle, these two straight lines shall be less than the other two sides of the triangle, but shall contain a greater angle.

2. Describe a parallelogram equal to a given rectilineal figure, and having an angle equal to a given rectilineal angle.

State the purpose of a proposition in the second book where this problem will be required.

3. If a straight line be divided into two equal parts, and also into two unequal parts, the rectangle contained by the unequal parts, together with the square on the line between the points of section, is equal to the square on half the line.

4. If a straight line be divided into two equal and also into two unequal parts, the squares on the two unequal parts are together double of the square on half the line and the square on the line between the points of section.

5. Define a circle, and show that a circle cannot have more than one centre.

If two circles cut one another, they shall not have the same centre.

6. The angles in the same segment of a circle are equal to one another.

App. IV. Staff College.

7. To inscribe a square in a given circle,

Prove that the inscribed square will be half the size of a circumscribed square.

8. To inscribe an equilateral and equiangular pentagon in a given circle.

A straight line drawn through the pentagon between two of its angular points is parallel to a side of the pentagon.

MATHEMATICS.—Rev. W. N. GRIFFIN, M.A.

Fourth Paper (*Voluntary*).

1. Define duplicate ratio. What are the numbers of which the ratio 9 : 121 is the duplicate ratio?

Prove that similar triangles are to one another in the duplicate ratio of their homologous sides.

2. Equiangular parallelograms have to one another the ratio which is compounded of the ratios of their sides.

3. Define a plane. Prove that from a given point in a plane there cannot be drawn two straight lines at right angles to the plane on the same side of it.

4. Given a circle, describe another of half its area.

5. Of all rectangles which have a given line for a diameter, prove that none can have an area exceeding half the square on the diameter.

6. Employ logarithms

(1) to find a third proportional to ·00846 and 59·3724;

(2) to extract the 5th root of ·0837;

(3) to find the 87th term of the series

$$1, \tfrac{2}{3}, \tfrac{4}{9}, \tfrac{8}{27}, \ldots,$$

7. The area of a regular pentagon being a square yard, find the distance between one of its angular points and the opposite side.

8. Between two points, a quarter of a mile apart, a road is made with uniform curvature of half a mile radius. What is the length of the road between the two points?

9. Find the inclination to one another of two contiguous faces of a regular tetrahedron.

10. In a straight horizontal road an observer finds the point where a visible object has its greatest elevation 38° 17′ 54″, and proceeding 200 yards from this point along the road he finds the elevation of the object to be 29° 10′ 34″. Find the height of the object above the horizontal plane in which the road lies.

MATHEMATICS.—Rev. W. N. GRIFFIN, M.A.

Fifth Paper (*Voluntary*).

1. Solve the equations

(1) $x^3+3x^2+x=2$.

(2) $\left.\begin{aligned} 3x+\sqrt{y}&=4 \\ x^2+y&=2 \end{aligned}\right\}$.

2. Show that the quadratic

$$\left(\frac{x+h}{a}\right)^2+\left(\frac{mx+k}{b}\right)^2=1$$

gives two values of x equal to one another when $(mh-k)^2=m^2a^2+b^2$.

3. If $(\sin\theta+\cos\theta)(\operatorname{cosec}\theta-\sec\theta)=1$, find the values of θ.

4. The sides of a triangle being 3·018, 3·987, and 4·937 feet, find the diameter of the circumscribing circle.

5. A well, 6 feet in diameter, is dug to the depth of 20 feet. If the earth taken out be heaped to a cone 5 feet high, find the diameter of the cone's circular base.

5. Four equal balls lie on a table in contact, so that their centres are the angular points of a square. A string is tied round them in the plane of their centres, causing each ball to press on those next to it with a pressure of 1 lb. What is the tension of the string?

7. A body started with a velocity slides up an inclined plane during 24 seconds until its velocity is destroyed, and then slides down to its original position in 40 seconds, the plane being inclined at 30° to the horizon. Find the co-efficient of friction between it and the sliding body.

8. Two bodies are projected simultaneously from the same point with the same velocity of 100 feet per second, one vertically upwards, the other downwards. Find the distance between them after 10 seconds.

9. The atmospheric pressure being 15 lbs. on the square inch when the barometer is 30·4 inches high, find the specific gravity of mercury.

[A cubic foot of water weighs 1,000 ounces.]

10. A pond is crossed by a bridge 10 feet wide with a semicircular arch of 16 feet span. If the water rises so as just to fill the arch, find its force tending to lift the bridge.

MILITARY HISTORY.—Captain J. P. BATTERSBY, 60th Rifles.

First Paper.

1796.

1. Give an outline of the campaign as sketched by the Directory for the guidance of Jourdan and Moreau; and mention anything that may strike you as having been faulty in the conception, giving the reason for your opinion.

2. Give a short account of the battle of Amberg, with sketch; and describe the critical nature of the French position at its close.

1800.

3. Describe the manner in which Napoleon masked the concentration of the army of reserve at Lausanne; his administrative arrangements for the supply of the army and for the conveyance of the matériel in crossing the Alps.

4. Sketch the theatre of war in Italy in 1800, showing Napoleon's line of operations and also that of the Austrians under Mélas. By what considerations was Napoleon influenced in choosing the Great St. Bernard as the point of passage for the bulk of his army? And point out the great strategical advantage presented by such a line to the French.

1813.

5. What were the chief difficulties which Wellington had to overcome in operating by his left at the opening of the campaign? And describe the measures he took to carry out and mask his plans.

6. Describe, with sketch, the position of both armies in the basin of the Zadora previous to the battle of Vittoria. What were the chief defects of the French position, and of Joseph's arrangements, both tactical and administrative.

MILITARY HISTORY.—Captain J. P. BATTERSBY, 60th Rifles.

Second Paper.

1796.

1. Give a short summary of the campaign, showing its chief strategical features and their bearing upon the ultimate success of the Austrians.

2. Describe the position of the forces on both sides when Moreau commenced his retreat from the Iser; and explain the critical nature of Moreau's situation at this period of the campaign.

1800.

3. What constituted the great importance of the line of the Po, from Pavia to Piacenza, to both parties? What steps did Mélas take to seize it, and to what do you attribute his failure?

4. Sketch the field of Marengo, showing the position of both parties at 3 p.m., when Desaix arrived from Nori; and describe the subsequent events of the battle and the ultimate triumph of the French. To what do you mainly attribute the defeat of the Austrians?

1813.

5. What were, in your opinion, the two most critical periods of the campaign for the French previous to the battle of Vittoria? and explain the difficulties of their position on each occasion.

6. Describe, with sketch, the series of operations subsequent to the passage of the Esla and Douro by which Wellington shifted his base from Portugal to the northern coast of Spain. What were the chief strategical advantages of this new position to the allies?

Military Geography.—Captain J. P. Battersby, 60th Rifles.

Third Paper.

1. Give a descriptive account, with sketch, of the basin of the Rhine from Bâle to Cologne, mentioning the principal fortresses along its course, and the object of their construction, the states through which the river passes in its course, and the encircling heights.

2. Sketch the French frontier from Strasbourg to Nice, and mark the entire outline of Switzerland.

In a war between France and Austria, what advantage would the possession of Switzerland confer on the former?

3. Define, in writing, the positions of the following places, and explain the importance which, from their position in the theatre of war, attached to each of them in the campaign of 1800:—

Piacenza,
Bard,
Ivrea,
Pavia,
La Stradella.

4. Sketch the frontier-line of France and Spain, showing the main lines of communication between the two countries. From what does the Ebro derive its importance as a line of defence for Spain against a French invasion?

5. Sketch the country between the Moselle and Rhine, and mark the position of both armies at the opening of the campaign of 1796, and the fortified places in possession of each.

What were the chief defects in the French position?

French.—M. Savoye.

I.

Traduisez en Anglais:—

A.—*Mœurs militaires.*

Chaque jour et chaque nuit on lance des patrouilles de cavalerie qui ont mission de battre le pays; on pousse des reconnaissances avec des divisions entières et on livre des combats sanglants pour évaluer les forces qu'on a devant soi; les habitants des villages que l'on traverse sont obligés de donner des renseignements de la véracité desquels leur tête répond; enfin, des espions nombreux apportent à chaque instant des nouvelles aux états-majors. D'après toutes les indications recueillies ainsi, deux généraux en chef combinent leurs mouvements de façon à se rencontrer pour livrer bataille: les deux armées se mettent en marche, et après plusieurs étapes on est fort étonné, des deux côtés, en apprenant qu'on s'est éloigné au lieu de se rapprocher. D'autres

fois, les deux armées manœuvrent de façon à s'éviter réciproquement, et un beau matin elles se trouvent inopinément en face l'une de l'autre. Cependant patrouilles, reconnaissances, espions avaient fait les rapports les plus clairs, les plus précis, sur la position de l'ennemi. Ces erreurs ont pour cause le soin avec lequel les généraux cherchent à dissimuler leurs plans; il n'est pas de ruses qu'ils n'emploient pour y arriver.—*Souvenirs de la campagne d'Italie.*

B.—*L'habit du chevalier de Grammont.*

. . . . Je l'avais, dit le valet de chambre, empaqueté, serré, ployé, que toute la pluie du monde n'en eût point approché. Me voilà à courir jour et nuit, connaissant votre impatience, et qu'il ne faut pas lanterner avec vous . . . .—Mais où est-il, m'écriai-je, cet habit si bien empaqueté?—Péri, monsieur, me dit-il en joignant les mains.—Comment, péri! lui dis-je en sursaut.—Oui, péri, perdu, abîmé! que vous dirai-je de plus?—Quoi! le paquebot a fait naufrage? lui dis-je.—Oh! vraiment, c'est bien pis; comme vous allez voir, me répondit-il. J'étais à une demi-lieue de Calais, hier matin, et voulus prendre le long de la mer pour faire plus de diligence; mais, ma foi, on dit bien vrai qu'il n'est rien tel que le grand chemin; car je donnai tout au travers d'un sable mouvant, où j'enfonçai jusqu'au menton.—Un sable mouvant près de Calais? lui dis-je.—Oui, monsieur, me répondit-il, et si bien sable mouvant que je veux être pendu si l'on me voyait autre chose que le haut de la tête quand on m'en a retiré. Pour mon cheval, il a fallu plus de quinze hommes pour l'en sortir; mais quant à mon porte-manteau, où malheureusement j'avais mis votre habit, jamais on n'a pu le trouver; il faut qu'il soit pour le moins une lieue sous terre.—Hamilton, *Mémoires du Chevalier de Grammont.*

II.

Questions grammaticales.

1. "On livre des combats sanglants"—"des espions nombreux" (I. A.).—Si l'adjectif, au lieu de le suivre, précédait le substantif dans ces deux phrases, quel autre changement en résulterait-il? Expliquez la règle à ce sujet.

2. Ecrivez le participe présent, la première personne du singulier du passé défini de l'indicatif, et de l'imparfait du subjonctif du verbe *obliger;* et la première personne du singulier de l'indicatif présent, du futur présent, et de l'imparfait du subjonctif de *recueillir.*

3. "se rencontrer"—Ecrivez la troisième personne du pluriel féminin du plus-que-parfait de l'indicatif de ce verbe,—et traduisez: *after having met* (speaking of females)—*supposing they had met* (speaking of men).

4. "Au lieu de se rapprocher" (I. A.).—Faites l'analyse grammaticale de cette phrase, et dites les règles de syntaxe qui s'y rattachent.

5. "il n'est pas *de* ruses qu'ils n'*emploient*" (I. A.).—Pourquoi *de* ruses, et non *des* ruses?—A quel mode se trouve *emploient?* Donnez la règle grammaticale à l'appui de votre réponse.

6. "en joignant *les* mains" (I. B.).—D'après quelle règle dit-on *les* mains, et non *ses* mains?

7. Quelle différence faites-vous entre *après* et *d'après*, entre *ou* et *où*, entre *pis* et *pire*, entre *le pis* et *le pire*, entre *mieux* et *meilleur*, entre *le mieux* et *le meilleur?*

III.

Translate into French:—

Notwithstanding the severity of a Canadian winter, military operations were continued; and on the seventeenth of December the grenadier and one battalion companies of the Royal Scots marched from Burlington under the command of Lieut.-Colonel Gordon towards Niagara; and on the nineteenth the grenadiers, commanded by Captain Bailey, assisted at the storm and capture of Fort Niagara without sustaining any loss; and the battalion company advanced to dislodge the enemy from the heights of Lewiston. Colonel Murray, in his report of this transaction to Lieut.-General Drummond, observes: "I have to express my admiration of the "valour of the grenadier company of the Royals under Captain Bailey, "whose zeal and gallantry were very conspicuous;" and in a general order

published on this occasion, Lieut.-General Drummond stated: "The troops " employed were the grenadier company of the Royal Scots, 100th Regi- " ment, and flank companies of the 44th. Their instructions were, not to " fire, but to carry the place at the point of the bayonet. The orders were " punctually obeyed, a circumstance that not only proves their intrepidity, " but reflects great credit on their discipline. Lieut.-General Drummond " will perform a most gratifying duty in bringing under the notice of his " Royal Highness the Prince Regent, through his Excellency the Commander " of the Forces, the admirable execution of this brilliant achievement on the " part of every individual concerned."—*Historical Records of the British Army* (1813).

German.—Professor Max Müller.

Translate into English:—

Die Armeen müssen vermindert werden, nicht blos aus financiellen Rücksichten, sondern auch aus technischen Gründen. Die französische Revolution rief eine Armee von 1,500,000 Mann auf die Beine, um die von allen Seiten andrängenden Feinde zu vertreiben. Napoleon, mit seinem großen strategischen Talent, wußte später solche Kräfte zu bewegen und zu benutzen, bis sein Uebermuth ihn stürzte. Aber auch nur selten wird ein solches Talent erscheinen und die Gelegenheit finden sich auszubilden. Was helfen dann diese Massen, die in ungeschickter Hand sich selbst verzehren und vernichten? Haben wir doch noch in diesem Sommer (1859) es sehen müssen, wie 4 bis 500,000 Mann ganz ohne alle höhere strategische Leitung gegen einander fochten, in der Richtung, wie Berge und Flüsse ihnen den Weg zeichneten; denn man nenne nicht den Flankenmarsch der Franzosen von Alexandrien bis Palastro und Turbigo ein strategisches Manöver. Wenn Parma neutrales Gebiet war, konnte man nicht zwischen Pavia und Piacenza den 600 Ellen breiten Po überschreiten, also mußte man über den Ticino zu gehen suchen. Die Gefechte waren reine Kraftproben zwischen den Soldaten, ohne höhere Leitung und umsichtige Benutzung der von ihnen erfochtenen Vortheile.

Translate into German:—

A few hours elapsed before the generals returned. Their movements were followed with intense interest by all the officers and by the whole army. It was known that the French and the English commanders differed on the necessity of a general assault, and every gesture of the French general was interpreted as indicating his anxiety for immediate action. There was a small stream which divided the two camps. Several bridges had been thrown across, some for foot passengers only, others strong enough for cavalry to pass over. Near one of these bridges a kind of watch-tower had been constructed which commanded not only the whole valley, but allowed a distant view towards the sea. When the generals and their staff came near that tower they halted, and after saluting each other, they galloped off in opposite directions.

Write an essay in German on "Fortresses."

Grammatical Questions.

1. Decline der Alte General.
2. Conjugate the indicative present, imperfect, and perfect of Sehen.
3. Give the German names for Sweden, Norway, Spain, Milan, Venice, Sicily.
4. *Translate into German:*—Two pounds of beef; half-a-dozen of cigars; one mile and a half; a quarter to six; before sunrise; good morning.

Hindustani.—Rev. W. D. Maclagan.

I.—*Grammar.*

1. What parts of the verb are used in composition with *saknā, chāhnā, chuknā,* and *lagnā* respectively?

2. How is the agent case used, and with which of the following verbs would it be required? *lānā, lenā, bolnā, kahnā, lejānā, chāhnā, lagnā.*

3. What are the indefinite tenses? Give examples of their use.

4. Write the Hindustani equivalents for the following expressions, and state what postposition is required with each:—*in exchange, in respect of, without, in the manner of, in company with, across.*

5. What is the general rule for forming ordinal from cardinal numbers? Give examples, and mention exceptions. How are these forms modified in the feminine and plural?

6. What verbs are used, and how, to express giving and obtaining permission?

7. Translate:—I have told him all that I know. He took an oath. Be patient—you will have to undergo much toil. Leave us to talk together. A large ship came in sight. The regiment marched yesterday.

II.—*Translate into English the following passages:—*

ایک دِن راہ مین توڑا اشرفیون کا پڑا پایا تینون کہین اُتري اَور بولي کہ اِسکو تقسیم کرلین اَور یہان سي پھر کر اپني اپني گھر چلین چند روز خوشي سي گذران کرین لیکن ہر ایک یہي چاہتا تھا کہ مَین ہي لُون دُوسرا اِس مین شریک نہ ہو اِس خیال مین تینون حیران ہوئي نہ یہہ ہمّت تھي کہ زر کا خیال چھوڑین اَور راہ مین پڑا رہنے دین نہ اِسپر راضي کہ آپسمین حِصّي کرلین غرض اِسي تردّد مین ایک رات دِن تینون مَیدان مین بھوکھي پیاسي پڑي تھي دُوسري روز وہانکا بادشاہ شکار کو نکلا تھا اِتفاقا مقُربون کي ایک گروہ کو ساتھ لیکر بروقت پہُنچا اَور اُن تینون کو مَیدان مین بیٹھي ہوئي دیکھ احوال پوچھا ۞

پھر خواجہ بولا کے بادشاہ سلامت! جب یي بھائي اپني دانست مین میرا کام تمام کر کي چلي گئي — ایک طرف مَین اَور ایک طرف یہہ سگ میري نزدیک زخمي پڑا تھا * لہو اِتنا بدن سي گیا کے مُطلق طاقت اَور ہوش کُچھ باقي نے تھا — کیا جانُون دم کہان اٹک رہا تھا کے جیتا تھا * جس جگہہ مَین پڑا تھا ولایت سرندیپ کی سرحّد تھي — اَور ایک شہر بہُت آباد اُس کي قریب تھا — اُس شہر مین بڑا بُتخانہ تھا — اَور وہان کي پادشاہ کي ایک بیٹي تھي نہایت قبول صُورت اَور صاحبِ جمال ۞

App. V. Staff College.

III.—*Translate into Hindustani :—*

A. In this country of India, on the death of a noble or of any people of substance, their bodies are burned; and eke their wives follow them alive to the fire, and for the sake of worldly glory, and for the love of their husbands, and for eternal life, burn along with them, with as much joy as if they were going to be wedded; and those who do this have the higher repute for virtue and perfection among the rest. Wonderful! I have sometimes seen, for one dead man who was burnt, five living women take their places on the fire with him, and die with their dead. There be also other pagan-folk in this India who worship fire; they bury not their dead, neither do they burn them, but cast them into the midst of a certain roofless tower, and there expose them, totally uncovered, to the fowls of Heaven.

Travels of Friar Jordanus, 1330.

B. At first when we began to ascend the mountain, the air seemed colder and colder; but before we had gone far the clouds cleared and the sun broke out, and from that moment the heat was excessive. Many beautiful birds of various colours were flying about us in the early morning, and two or three large snakes crossed our path. One large and beautiful stag fled at our approach.

FORTIFICATION.—Lieut.-Colonel SCOTT, R.E.

MORNING.

(*Where no scale is named, careful hand-sketches are required.*)

1. Explain the meaning of the following terms:—"Parados," "Epaulement," "Machicoulis Gallery," "Tambour," "Plane of Site," "Plane of Defilade."

2. Explain, with the assistance of diagrams, the more expeditious modes of providing cover for men when no impediment is required in front of the breastwork.

3. Describe, with the assistance of diagrams, the following methods of revetting field-works:—With gabions, fascines, sand-bags, and sods.

4. Draw a sketch of the profile of an ordinary field-work, and state the considerations which regulate the dimensions and direction of each line in the figure.

5. Draw the plan of part of two faces of a field-work having the profile given in reply to question 4, and making an angle of 70° with each other, salient towards the enemy. Their crests are to be shown for a length of 30 yards, and the ditches to be 10 feet deep throughout.

The calculations for determining the width of the ditch on the data assumed or given are to be shown.

Scale 30 feet to an inch.

6. Explain the difference between "open" and "enclosed" works, and state the circumstances under which it would be advisable to adopt works of the latter rather than of the former class. Point out the defects of circular and square redoubts.

7. What are "abattis," "palisades," and "fraises"? What is their object, and where should they be placed?

8. Define the terms "Enfilade" and "Ricochet" as applied to artillery-fire.

9. A redoubt is to be constructed on a hill, which is commanded by another hill 600 yards distant from it.

Explain how you would endeavour to defilade the redoubt, by choosing the form, the position, and the profile most suitable to such a case; and state what further expedients might still be necessary to accomplish the object, after due regard had been given to the three points above mentioned.

10. Describe the manner in which you would put into a state of defence a small country-house, selecting an example affording the means of elucidating the various expedients which may be adopted in the generality of such cases.

Your reply is to be illustrated by diagrams.

FORTIFICATION.—Lieut-Col. SCOTT, R.E.

Afternoon.

1. Explain the meaning of the following terms:—"Trace of a work," "Enceinte," "Magistral line," "Outworks," Advanced works."

2. Explain the connexion between the relief and the trace in the bastion system of Fortification, and show the effect which an increase of relief will have on the curtain, the exterior side, and the bastion.

3. Sketch the profile of a rampart having a revetment crowned by a chemin de rondes; and state its advantages and disadvantages as compared with one having a full revetment, supposing that the relief of both ramparts is the same.

4. Give a hand sketch of a front of Vauban's third system. What is the object of the detached bastions?

5. Explain the uses of a Tenaille in a front of Fortification.

6. In the trace of the enceinte of the modern French system, what variation from that of Cormontaigne has been adopted, and with what objects?

7. Give sketches of a horn-work and a crown-work. When are such works applicable in Permanent Fortification? Would you term them outworks, advanced works, or detached works?

8. State briefly the salient features of Carnot's system, and of its defence.

9. Mention the grounds of the advantages claimed for the Prussian system on the following points:—

(1.) The defences of the ditches of the body of the place and of the Ravelin.

(2.) The opposition to the enemy's approaches on the capital of the Ravelin.

(3.) The number of men required for the garrison, and their protection.

10. At what period of the siege-works does the second parallel become necessary? and how it it constructed?

Draw the section of a second parallel on a scale of 5 feet to an inch.

11. Why are trench cavaliers constructed? Explain their construction, with the assistance of a diagram.

GEOLOGY AND MINERALOGY.—S. P. WOODWARD, F.G.S.

1. Enumerate the several means of determining the species of a mineral.

2. What is meant by the *primary crystalline form* of a mineral? and how may it be ascertained?

3. Why is the crystalline form so important in identifying minerals, since in most species many modifications occur, and of *calcite* 800 varieties have been described?

4. What are the essential constituents of Aragonite, Anatase, Corundum, Graphite, and Wolfram?

5. What is the prevailing direction of *mineral veins* in England and most parts of Europe?

6. Explain the meaning of the terms shale, slate freestone, breccia, conglomerate.

7. By what means have the crystalline rocks formed in the interior of the earth become exposed to view in sea-cliffs and hill sides?

8. Explain the geological phrase "axis of elevation," and illustrate by a section.

9. State the essential conditions, in the composition and arrangement of the strata, for a permanent water-supply by means of wells.

10. Describe the topographical range and physical characters of the chalk formation in England.

11. From what formations and localities are the materials chiefly obtained for the manufacture of Plaster-of-Paris and the hydraulic cements?

12. What are the physical conditions and organic remains of the strata accompanying the coal of the carboniferous age?

13. Give the principal characteristics of the following genera:—Ammonites, Belemnites, Phacops, Graptolites, Pterichthys, Ichthys, Ichthyosaurus.

App. V. Staff College.

14. Specify the strata which have afforded fossil remains of the vertebrate animals, viz. Mammalia, Birds, Reptiles, and Fishes.

15. Explain the practical application of a knowledge of the distribution of fossils in the strata.

16. Make a list of the stratified rocks according to the order of their superposition.

Experimental Science.—Professor Liveing.

1. Describe the method of making a common thermometer, and explain how to graduate it to Fahrenheit's scale.

2. What is the generally received theory as to the nature of heat? State some of the facts which confirm this supposition.

3. Explain the conditions under which clouds are formed, and the effect of a range of hills in producing clouds.

4. Explain what is meant by "latent heat." If 1 lb. of ice at 32° and 2 lbs. of water at 212° be mixed, what will be the resulting temperature of the mixture?

5. What relation usually subsists between the radiating and absorbing powers for heat of the same substances? Explain how to compare the radiating powers of two substances. State the several circumstances on which the rate of cooling of substances depends.

6. State reasons, from observed facts or analogies, which justify the use of the names *positive* and *negative*, as applied to the two kinds of electrical excitement.

7. What is the law according to which the attraction or repulsion of two electrified bodies varies with the distance between them? Explain some means means by which this law may be verified. How do you account for the attraction between an electrified and an unelectrified body, as, for example, the attraction of a stick of sealing-wax when rubbed, for small objects near it?

8. Describe the electrical condenser; and explain its action. How would you apply it to determine the electrical condition of the poles of a galvanic battery?

9. What is the ordinary electrical state of the atmosphere? If you place an electroscope out of doors, it almost always shows signs of electricity, but not so if inside a house: how do you account for this?

10. State, approximately, the positions of the north and south magnetic poles of the earth. In what respects does the action of the earth upon a magnet resemble that of a large magnet upon the same? and in what respects is it unlike this?

11. Describe the process of electrotyping in copper; and explain the action, both electrical and chemical.

12. What are the most common effects of lightning upon—1st, a good conductor, such as an iron rod communicating with the ground; 2nd, an interrupted conductor, such as an iron rod fixed on a block of stone or on dry wood? Show that the action of smaller discharges of electricity is similar in kind.

13. Describe and explain a method of making nitric acid. What is the action of this substance upon carbonate of lime, copper, and tin respectively.

14. Define an element. State which of the following substances are elements:—chlorine, silica, mercury, air, brass, lime, phosphorus. Describe the chief characters of the first, and the mode of preparing it.

15. Explain what are meant by chemical equivalents. How much dry sulphate of soda will exactly decompose 100 grains of nitrite of baryta, the combining weights of sulphur, sodium, nitrogen, and barium being as 16 : 23 : 14 : 68?

16. What are the chief causes of hardness in water? Explain the effect of carbonate of soda upon hard water. Mention any other means by which hard water may be made soft; and explain the chemistry of it.

Military Drawing.

For Sketch,—a portion of the Ordinance Survey of Westmorland.—Scale 6 inches to 1 mile.

Instructions.

1. *Copy the plan in pen, pencil, or brushwork; using a horizontal or vertical style of hachure as you may prefer.*
2. *Draw a scale for the plan.*
3. *Draw Sections as accurately as you can on the lines* A.B., C.D., & E.F.
4. *Represent a marsh, a village, a sea-beach and overhanging cliffs, and a wood suitable for the above scale.*
5. *Print the Title neatly in the character given in the copy.*

Appendix, No. VI.

Synopsis of the present course of Instruction at the Staff College, 1863.

Mathematics.

Officers are required to enter the Staff College with a competent knowledge of Arithmetic, Algebra to the end of simple equations, and Euclid, books I.—IV. The course is then as follows:—

(1.) Quadratic and simultaneous equations, ratio, proportion, and variations; arithmetical and geometrical series, indeterminate coefficients, piles of shot, logarithmic and exponential series. These will be found in Mr. Todhunter's Algebra for schools and colleges.

(2.) Euclid, Book VI., together with the tracts on planes and solids, propositions 1—15, and that on ground problems in Mr. Narrien's Geometry.

(3.) Elementary trigonometry as given in Mr. Hudson's Trigonometry or Messrs. Galbraith and Haughton's Trigonometry.

(4.) The mensuration of triangles, quadrilaterals, polygons, circles, prisms, cylinders, cones, and spheres, as given in Mr. Moore's Treatise of Mensuration, which will be shortly published.

(5.) Elements of statics and dynamics, as given in Mr. Twisden's Practical Mechanics, Part I. Chapters 2—8, and Part II. Chapters 1—4.

(6.) Elements of hydrostatics, as given in Messrs. Galbraith and Haughton's Elements.

The officers of the Staff College who take up mathematics are required to know the *text* of the above, and also to be able to work examples. A more specific statement of the course will be found in the syllabus annexed.

Practical astronomy. The necessary parts of spherical geometry (given in Narrien's Geometry) and trigonometry. The principal methods of determining the latitude and longitude of a *fixed* station, the clock error and the variation of the compass, from observations made with a sextant. The adjustments of the transit instrument and the altazimuth instrument or great theodolite, and the mathematical principles of the method of conducting a trigonometrical survey.

Mr. Narrien's Astronomy and Geodesy is very much more extensive than the course, and attention should be confined to Chapter I.; Chapter III., Articles 56—66; Chapter IV., Articles 72—96, 104—106; Chapter V.; Chapter XIV., Articles 303—310; Chapter XVI.; and Chapter XVIII., Articles 385—411.

App. VI. Staff College.

Syllabus of Arithmetic and Algebra.

[The Treatise of Algebra to which reference is made is Mr. Todhunter's "Algebra for the use of Schools and Colleges."]

1. The ordinary rules for reducing surd expressions.—Arts. 279–298.
2. The ordinary rules for solving quadratic and simultaneous equations.
3. The ordinary propositions in "ratio, proportion, and variation."—Arts. 369–404, 411–425.
4. Arithmetical progression—
   (*a.*) To find the sum of n terms of an arithmetical series.—Art. 450.
   (*b.*) To insert m arithmetic means between a and b.—Art. 452.
5. Geometrical progression—
   (*a.*) To find the sum of n terms of a geometrical series. Art. 464.
   (*b.*) To insert m geometric means between a and b.—Art. 469.
   (*c.*) The sum of $a + ar + ar^2 + \ldots$ *ad inf.* $= \frac{a}{1-r}$.
   when $r < 1$; and to explain what is meant by the sum of a series *ad infinitum*.—Arts. 465, 466.
6. To find the amount of a sum of money at simple interest; also at compound interest. Arts. 570, 571.
7. To find the amount of an annuity left unpaid for n years, and the present value of an annuity to continue for m years, at compound interest.—Arts. 593, 594.
8. If $a + a_1x + a_2x^2 + \ldots + a_nx^n = A + A_1x + A_2x^2 + \ldots + A_nx^n$ for all values of x then will $a = A$, $a_1 = A_1$, $a_2 = A_2$, $\ldots a_n = A_n$—*i.e.* to prove the principle of "indeterminate coefficients:"—to explain the deficiency of the proof if either of the above expressions does not consist of a finite number of terms.—*MS.*
9. Application of the method of indeterminate coefficients—
   (*a.*) To the determination of the number of shot in a square, triangular, or oblong pile.—Arts. 655, 661, 662, 663.
   (*b.*) To the simpler cases of the decomposition of algebraical fractions.—*MS.*
10. Definition of the logarithm of a number, and proofs of the common rules of logarithmic arithmetic. Advantage obtained by taking 10 as the base of the tabular logarithms.—Arts. 531–541.
11. Proof of the exponential and logarithmic series by the method of indetermediate coefficients—
   (*a.*) $a^x = 1 + Ax + \frac{A^2x^2}{1\cdot2} + \frac{A^3x^3}{1\cdot2\cdot3} + \ldots$ Art. 542.
   (*b.*) If e is that value of a which renders $A = 1$, then is—
   $$e = 2 + \frac{1}{1\cdot2} + \frac{1}{1\cdot2\cdot3} + \ldots$$
   and proof of the convergency of this series.—*MS.*
   (*c.*) $\log_a N = \frac{1}{\log_e a} \log_e N$. —*MS.*
   (*d.*) $\log_e (1 + x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \ldots$
   proof that this series is convergent when $x < 1$.—*MS.*
   (*e.*) If δ and δ_1 are small relatively to n_1 then
   $$\log (n + \delta) - \log n = \frac{\delta}{\delta_1} \{ \log (n + \delta_1) - \log n. \}$$—*MS.*

Syllabus of Geometry.

[The Book referred to is Mr. Narrien's "Geometry."]

1. The definitions of Book V.
2. Plane geometry, Book VI.; omitting props. 7, 24, 26, 27, 28, 29, 32, AA.
3. The tract on the intersection of planes.
4. The tract on prisms and pyramids, props. 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13 14, 15

[The Treatise referred to is the "Manual of Plane Trigonometry" by Messrs. Galbraith and Haughton.]

1. The circular measure of an angle, pp. 2, 3.
2. The ordinary or sexagesimal division of an angle, p. 4.
3. The definitions of the trigonometrical functions of an arc and of an angle, pp. 7, 8, 9.
4. Proof of the formulæ, pp. 11–15, and *MS.*

(*a.*) $\sin^2 A + \cos^2 A = 1$.

(*b.*) $\frac{\sin A}{\cos A} = \tan A$ and $\frac{\cos A}{\sin A} = \text{cotan } A$.

(*c.*) $\sec A = \frac{1}{\cos A}$ and $\text{cosec } A = \frac{1}{\sin A}$.

(*d.*) To express cos A, tan A, cotan A, sec A, and cosec A in terms of the sin A.

5. Determination of the numerical values of the sine, cosine, &c., of angles of 45°, 60°, 30°, and 18° respectively, pp. 20–23.
6. Proof of the formula $A'' = \frac{A}{\sin 1''}$, p. 24.
7. Proof of the fundamental formulæ, pp. 35–38—

(*a.*) $\sin (A + B) = \sin A \cos B + \cos A \sin B$.
(*b.*) $\sin (A - B) = \sin A \cos B - \cos A \sin B$.
(*c.*) $\cos (A + B) = \cos A \cos B - \sin A \sin B$.
(*d.*) $\cos (A - B) = \cos A \cos B + \sin A \sin B$.

8. Proof of the formulæ, pp. 38, 39—

(*a.*) $\sin A + \sin B = 2 \sin \frac{A + B}{2} \cos \frac{A - B}{2}$.

(*b.*) $\sin A - \sin B = 2 \cos \frac{A + B}{2} \sin \frac{A - B}{2}$.

(*c.*) $\cos A + \cos B = 2 \cos \frac{A + B}{2} \cos \frac{A - B}{2}$.

(*d.*) $\cos A - \cos B = -2 \sin \frac{A + B}{2} \sin \frac{A - B}{2}$.

9. Proof of the formula, p. 40—

$$\frac{\sin A + \sin B}{\sin A - \sin B} = \frac{\tan \frac{A + B}{2}}{\tan \frac{A - B}{2}}$$

10. Proof of the formulæ, pp. 39, 40, 41—

(*a.*) $\sin 2A = 2 \sin A \cos A$, and $\sin A = 2 \sin \frac{A}{2} \cos \frac{A}{2}$.

(*b.*) $\cos 2A = \cos^2 A - \sin^2 A$.

(*c.*) $2 \sin^2 \frac{A}{2} = 1 - \cos A$ and $1 + \cos A = 2 \cos^2 \frac{A}{2}$.

11. Proof of the formulæ, p. 41.

(*a.*) $\tan (A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$.

(*b.*) $\tan (A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$.

(*c.*) $\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$.

12. Explanation of the geometrical interpretation of the negative sign.—*MS.*
13. Proof of the formulæ.—*MS.*

$$\sin (180° - A) = \sin A \text{ and } \cos (180° - A) = -\cos A.$$

14. Proof of the following rules, pp. 49, 50—

(*a.*) The sides of a triangle are proportional to the sines of the opposite angles.

(*b.*) The sum of any two sides of a triangle bears to their difference the same ratio that the tangent of half the sum of the opposite angles bears to the tangent of half their difference.

App. VI.
Staff College.

15. Proof of the formulæ, pp. 51–55 and *MS.*

(*a.*) $a^2 = b^2 + c^2 - 2bc \cos A.$

(*b.*) $\sin \frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{bc}}.$

(*c.*) $\cos \frac{A}{2} = \sqrt{\frac{s(s-a)}{bc}}.$

(*d.*) $\tan \frac{A}{2} = \frac{M}{s-a}$ where $M = \sqrt{\frac{(s-a)(s-b)(s-c)}{s}}.$

16. Solutions of each of the four cases of right-angled triangles by means of logarithmic tables, pp. 29–34.

17. Solution of each of the five cases of oblique angled triangles, pp. 60–68.

18. Explanation of the ambiguity of the third case of oblique angled triangles, p. 63.

19. Explanation of the terms—angle of vertical elevation of a point, and horizontal angle between two points, at the position of an observer.—*MS.*

20. Determination of the height of an accessible object above a horizontal plane, p. 69.

21. Determination of the height and position of an elevated point when a horizontal base can be measured:—

(*a.*) In a vertical plane passing through the point and the position of the observer.

(*b.*) When the base must be measured out of that plane.—*MS.*

22. Similar determinations when the base is not horizontal.—*MS.*

23. There are four points, A, B, C, D, on a horizontal plane; the distance AB is known; the method of determining the distance CD by means of angles measured at A and B.—*MS.*

24. Determination of the the length of AB, when CD is known, by means of angles measured at A and B.—*MS.*

25. Explanation of the modifications of 23 and 24 when A and B are on different sides of the line CD.—*MS.*

26. Determination of the position of a station by the observed angles between the lines drawn from the station to three given objects A, B, C:—

(*a.*) When the station is within the triangle A, B, C.

(*b.*) When the station is on the outside of the triangle A, B, C.—*MS.*

Syllabus of Mensuration.

[The propositions mentioned below are to be learned from MS.]

1. The area of a rectangle (the adjacent sides of which are *a*, *b*), is equal to *ab*—hence the area of any parallelogram.

2. The area of a triangle—

(*a.*) In terms of base and perpendicular.

(*b.*) In terms of two sides and the included angle.

(*c.*) In terms of the sides.

3. Propositions connected with 2 (*c.*)—

(*a.*) Radius of circle inscribed within a triangle.

(*b.*) Radius of a circle circumscribed about a triangle.

(*c.*) Area of a quadrilateral figure inscribed in a circle.

4. Area of a triangle in terms of the co-ordinates of the angular points.

5. Area of any rectilineal figure in terms of the co-ordinates of its angular points.

6. Area of a trapezoid.

7. Area of any irregular quadrilateral figure.

8. Area of a regular polygon:—

(*a.*) When the number of sides and the oblique radius are given.

(*b.*) When the number of sides and the right radius are given.

(*c.*) When the number of sides and the length of one side are given.

9. The area of a right prism.

10. The area of a regular pyramid.

11. The volume of any parallelopiped is equal to the area of the base multiplied by the height; hence the volume of any prism.

12. The volume of any pyramid.
13. The volume of a frustum of a pyramid.
14. The volume of a frustum of a triangular prism.
15. The volume of a prismoid.
16. The area of the section of a rampart.
17. To find the depth of a ditch when the breadth of the upper surface, the slopes of the sides, and the area of section are given.
18. To find the breadth of a ditch, the transverse section of which is equal to the area of the section of a given breastwork and the glacis, when the depth and slopes of the side of the ditch are given, and the dimensions of the profile of the breastwork; the superior surface of the parapet being in the same plane as the glacis.
19. Volume of a given parapet or rampart.
20. Definition of a limit; statement of the general principle followed in reasoning on limits; definition of the tangent of a curve.
21. Newton's second lemma.
22. Newton's seventh lemma—with the deductions—
(*a.*) A circle is the limit of the inscribed polygon.
(*b.*) The limit of $\frac{\sin\theta}{\theta} = 1$. and of $\frac{\tan\theta}{\theta} = 1$.
23. The circumference of a circle, of which the radius is $r = 2\pi r$.
24. The area of a circle, of which the radius is $r = \pi r^2$.
25. Area of a sector, and of a segment of a circle.
26. Area of the surface of a cylinder.
27. Area of the surface of a cone, and of a frustum of a cone.
28. Area of the surface of segment of a sphere, and of a whole sphere.
29. Volume of a cylinder.
30. Volume of a cone and of a frustum of a cone.
31. Volume of a sphere.
32. Volume of a segment of a sphere.

Syllabus of Elementary Mechanics.

[The References are to Mr. Twisden's Practical Mechanics. Second Edition.]

A.—*Statics.*

1. Elementary examples on the work of agents.—Arts. 11–18.
2. The work done by a variable pressure can be represented by the area of a curve.—Art. 19 and prop. 1.
3. Work expended in lifting a rope.—Ex. 134.
4. The Steam indicator.—Art. 20.
5. Elementary definitions and principles of statics.—Arts. 23–48.
6. The parallelogram of pressures.—Props. 3, 4, 5, 6.
7. Triangle of pressures.—Art. 51.
8. If P, Q, R are three pressures in equilibrium about a point A, then—
(*a.*) P : Q : R :: sin QAR : sin RAP : sin PAQ.
(*b.*) $R^2 = P^2 + Q^2 + 2PQ \cos PAQ$.—Prop. 7.
9. Resultant of two parallel pressures acting towards the same parts.—Prop. 8.
10. Resultant of two parallel pressures acting towards contrary parts.—Prop. 8, cor. 2.
11. The moment of the resultant of two pressures with reference to any point is equal to the algebraical sum of the moments of the pressures with reference to the same point.—Props. 9, 10. On statical couples.—Art. 54. Extension of the principle of moments to any number of pressures whose directions lie in one plane.—Art. 58.
12. The rectangular components of a pressure.—Art. 59. The resultant of any number of pressures acting on a point, and the conditions of their equilibrium.—Prop. 13.
13. The resultant of any system of pressures acting in a plane (prop. 14), and the condition of their equilibrium.—Prop. 15.

14. To determine the resultant of any number of parallel pressures whose directions lie in the same plane.—Prop. 12.

15. To determine the centre of parallel pressures of any system of such pressures whose directions lie in the same plane.—Prop. 16.

16. Definition and principal properties of the centre of gravity.—Arts. 63–69.

17. Centre of gravity of a triangle (ex. 231); of a triangular pyramid (ex. 255); of a trapezoid (ex. 259).

18. Geometrical applications of the properties of the centre of gravity, viz., to the determination of the surface of a solid of revolution—prop. 17—of the volume of a solid of revolution—prop. 18—and of the volume of a portion of a cylinder terminated obliquely by a plane—prop. 19.

19. General conditions of equilibrium of a body that rests against a fixed surface; limiting angle of resistance; laws of friction.—Arts. 71–75.

20. Inclined plane and wedge.—Arts. 76–78.

21. The form of the thread of a screw.—Arts. 79, 80.

22.—The screw press (art. 81) and proof of the relation between the pressures (ex. 334): viz.—

$$Pa = Qr \tan(\alpha + \phi).$$

23. Condition of equilibrium of a body capable of turning round an axle.—Arts. 85, 86.

24. Wheel and axle and pulleys.—Art. 87.

25. The rigidity of ropes.—Art. 88.

26. Relation between power and weight in a tackle of n sheaves.—Art. 89 and ex. 366–376.

27. The steel yard.—Art. 41.

28. Elementary questions on the equilibrium of walls, and of the thrust of roofs.—Arts. 42–48.

29. Definition of the work done by a pressure, and cases in which a pressure does no work.—Art. 133.

30. Work of drawing a heavy body up or down an inclined plane.—Ex. 471–475.

N.B.—The above course is comprised in the following articles:—11–20, 23–82, 85–89. and 103.

B.—*Dynamics.*

1. Geometrical proofs of the familiar properties of the parabola; viz.—
   - (*a.*) Definitions.
   - (*b.*) Latus rectum=4. AS.
   - (*c.*) The tangent at a given point bisects the angle between the focal distance and the perpendicular drawn from that point to the directrix.
   - (*d.*) The subtangent=twice the abscissa.
   - (*e.*) The subnormal=half the latus rectum.
   - (*f.*) $PN^2 = 4AS.\ AN.$
   - (*g.*) $SY^2 = AS.\ SP.$
   - (*h.*) $QV^2 = 4SP.\ PV.$—*MS.*

2. Geometrical demonstration of the familar properties of the cycloid.—Appendix.

3. Elementary examples and principles.—Arts. 111–124.

4. Accelerating and retarding forces.—Art. 125.

5. Fundamental formulæ for uniformly accelerated motion; viz:—

(*a.*)	$v = V + ft.$	Art. 113.
(*b.*)	$s = Vt + \frac{1}{2}ft^2.$	Props. 23, 24.
(*c.*)	$v^2 = V^2 + 2fs.$	

6. The composition of velocities.—Art. 127.

7. Range and time of flight of a projectile with reference to any plane.—Ex. 609–626.

8. Path of a projectile in vacuo is a parabola: and its velocity at any point is that due to the height of the directrix above that point.—Prop. 26 and Cor.

9. Motion produced by a given pressure acting on a heavy point.—Arts. 118 and 129.

10. Units of work accumulated in a moving body.—Arts. 119 and 130.

11. Definitions of *mass, momentum, moving force,* and the three laws of motion.—Arts. 128, 131, 132.

12. Velocity acquired by a heavy body that descends a smooth curve.—Art. 120 and prop. 27.

13. Centrifugal force.—Art. 121 and prop. 28.

14. Influence of rotation of earth in diminishing the apparent force of gravity.—Ex. 669.

15. Time of a cyclodial oscillation.—Prop. 29.

16. Time of a small circular oscillation.—Ex. 671.

17. Change in the daily number of oscillations due to a small change in length of a pendulum, and change due to a small change in the force of gravity.—Ex. 673, 4.

18. Definition of the centre of oscillation and centre of percussion.—Art. 123.

19. Description of Atwood's machine.—Art. 145 and ex. 562, 563.

20. Nature of impulsive action, and elementary cases of the impact of smooth spheres.—Arts. 152–156.

N.B.—The above course is comprised in the following articles:—111–132, 145, 152–156, and Appendix.

Syllabus of Hydrostatics.

[The Work referred to is the "Manual" of Messrs. Galbraith and Haughton.]

1. The law of the transmission of fluid pressure.—Chap. 1, art. 1.

2. Measure of pressure at any point of a fluid.—Chap. 1, art. 2.

3. Pressure round an internal point equal in all directions.—Chap. 1, art. 3.

4. Pressure due to the weight of liquids.—Chap. 1, art. 4.

5. The free surface of a liquid acted on by gravity is a horizontal plane.—Chap. 1, art. 5.

6. Pressure on a horizontal section of a vessel of any shape containing a liquid.—*MS.*

7. The common surface of two liquids that do not mix is a horizontal plane.—*MS.*

8. Position of equilibrium of two liquids that do not mix on a bent tube.—*MS.*

9. Pressure on any plane area immersed in a liquid.—*MS.*

10. The centre of pressure on the case of a rectangular area, one side of which is horizontal.—Chap. 1, art. 7.

11. Form of the surface of a liquid contained in a vessel that rotates with a uniform velocity.—Chap. 1, art. 8.

12. Experimental proof of the elasticity, weight, and fluidity of gases.—Chap. 2, arts. 1–4.

13. The mercurial barometer.—Chap. 2, art. 5.

14. Boyle's law.—Chap. 2, art. 6.

15. Dalton's law.—*MS.*

16. Proof of the formula $\frac{v}{\mathrm{V}} = \frac{\mathrm{P}}{p} \cdot \frac{460 + t}{460 + \mathrm{T}}$.—*MS.*

17. Given the data of Prout experiments to show that the weight of a volume of dry air is $\mathrm{W} = \frac{5{\cdot}375\mathrm{V}p}{460 + t}$.—Chap. 2, art. 9.

18. Definition of specific gravity.—Chap. 3, art. 1.

19. Equilibrium of a floating body.—Chap. 3, art. 2.

20. Definition of metacentre and condition of stability of a floating body.—Chap. 3, art. 3.

21. The hydrostatic balance.—Chap. 3, art. 4.

22. Method of finding specific gravity of a solid, (1) heavier, (2) lighter than water.—Chap. 3, art. 4. Correction due to weight of atmosphere.—Chap. 4, art. 1.

23. Nicholson's hydrometer.—Chap. 3, art. 5.

24. Specific gravity bottle.—Chap. 3, art. 6.

25. Specific gravity of a substance in small fragments.—Chap. 3, art. 6.

App. VI.
Staff College

26. The common hydrometer.—Chap. 3, art. 7.
27. Specific gravity of a gas.—Chap, 3. art. 8.
28. Specific gravity of compound liquids and solids.—Chap. 3, arts. 9, 10.
29. Specific gravity of gaseous mixtures.—Chap. 3, art. 11.
30. If the atmosphere be divided into thin strata of equal thickness, their densities will be in geometrical progression.—*MS.*
31. The temperature of air and mercury being 32° Fah., if h and h_1 are the height of the barometer at the lower and higher of two stations respectively, the difference between the heights of the stations is $10000 \log. \frac{h}{h_1}$ fathoms. —*MS.*
32. The mountain barometer.—Chap. 4, art. 2.
33. The balloon.—Chap. 4, art. 3.
34. The suction pump.—Chap. 4, art. 4.
35. The forcing pump.—Chap. 4, art. 5.
36. The suction and lifting pump.—Chap. 4, art. 6.
37. The syphon.—Chap. 4. art. 7.
38. The safety tube.—Chap. 4, art. 8.
39. The Bramah press.—Chap. 4, art. 9.
40. The air-pump.—Chap. 4, art. 10.

Fortification.

Use of instruments.
Problems in plane geometry.
Construction of plain, diagonal, and comparative scales.

Text Book: *Macaulay's Field Fortifications.*

Field Fortification.—General principles.
Observations on the different field works, lines, &c.; their construction and application.
The occupation of irregular sites, and practical defilading.
The various obstacles recommended for defence, in what manner constructed, where placed, &c.
Considerations for determining the garrison of field works, and labour, &c. required in their construction.

Text Book: *Woolwich Fortification Papers.*

Permanent Fortifications.—The general principles of permanent fortification, with considerations which determine the relief and command of works.
The construction of Vauban's 1st and 3rd systems, the modern and polygonal systems; their relative advantages, &c. with reference to improved arms.
Remarks on advanced and detached works; and observations on works now in course of construction.
Attack and Defence.—The attack and defence of a fortress, with remarks as to probable changes arising from the use of improved fire-arms.
The construction of the different batteries, saps, &c. required in the attack.
Military Mining.—Terms used; description of different mines; method of charging, tamping, and firing mines; the demolition of stockades, gates, bridges, &c.
Military Bridging.—The considerations which determine the kind of bridge to be used, its position, &c.
The method of constructing many of the military bridges in use, or required under different circumstances.
Artillery.—Account of ordnance, projectiles, carriages, &c. used in the service, with remarks upon metal employed, form and dimensions of ordnance, &c.
Explanation of terms used in gunnery. The different kinds of artillery fire; for what purposes employed.
Form of trajectory; how influenced by resistance of the air, with causes of deviation in flight of projectiles.
The object of rifling cannon.
Advantages of rifling.
Principal considerations in rifling, length of projectile, charge, &c. required.

Probable advantages arising from the employment of rifled cannon in military operations.

The application of artillery in the field, including movements, choice of positions, &c.

How employed in the attack and defence of fortresses and posts. The passage of rivers, &c.

Military Drawing and Surveying.

Drawing (in class rooms) from examples showing the rise and fall of ground; hilly ground, &c. &c. Details and conventional signs of military maps and sketches. Sketching from models of hills.	First three months.
These drawings are in the *horizontal* style of etching.	
Instruction in the use of instruments, viz., theodolite, pocket sextant, prismatic compass, &c. &c.	Second quarter.
Triangulation of about two square miles. Traversing roads, streams, &c. &c.	
Contouring	
Sketching a portion of hilly ground on a large scale, say 12″ to one mile.	Second half year.
Survey of two square miles.	
Eye sketching, and the	Third half year.
Principles of road making.	
Reconnaisances	Fourth half year.

N.B.—The *horizontal* hachures are used in pen and ink drawings.

Military Administration and Legislation.

The instruction in this branch is imparted by means of lectures delivered by the professor, the students taking notes thereof.

Organization and Administration.

Recruiting.—System of.

Organization of the Three Arms.—Principles to be observed; combinations for field service.

Organization of Departments.—Commissariat, medical, and military train, in time of peace, and in the field.

Equipment.—Arms, ammunition, clothing, tents, tools, &c. for field service; reserve stores.

Departments.—Respective duties and principles of action of each; proportion of military staff for an army in the field.

Subsistence.—Food, forage, and allowances in kind; best description and supply in the field.

Medical Arrangements.—Formation of and supplies for hospitals; ambulance.

Transport.—Proportion in the field; best description; distribution.

The respective duties of the different departments illustrated in considering the following subjects, viz.:—

Embarkation.—Arrangements for; tonnage, &c.

Duties on board ship.

Disembarkation.—Arrangements for.

March.—Order of; extent; time.

Encampment.—Selection and formation.

Military Legislation.

Consideration of the Military Code.—Mutiny Act and articles of war.

Persons subject to military law.

Convention, jurisdiction, and powers of courts-martial.

Appointment and duties of president, members, and officiating judge-advocate.
Framing charges.
Preliminaries to trial.
Form and proceedings of trial.
Duties of prosecutor.
Nature of evidence.
Defence.
Finding and sentence.
Courts of inquiry.
The law and regulations relating to enlistment, re-enlistment, and discharge.

Military History.

The instruction in this branch is also by lectures, the students taking notes, and furnishing written memoirs prepared from their notes, and from various books of reference, of which there is a large collection in the library.

The lectures vary occasionally, according to circumstances. The following is the course for 1862–63.

First Term.

Modern conditions of war traced briefly.
Campaign of Waterloo.
Physical geography of North America.
Campaign of 1757.
Battles of Prague, Kollin, Rosbach, and Leuthen.
Elements of strategy, with illustrations from the preceding campaigns.
Elements of tactics, with illustrations from the preceding battles.

Second Term.

Campaign of Marengo.
Battle of Marengo.
Campaign of Jena, with battles of Jena and Auerstadt.
Military movements in Virginia and Maryland.
Campaign of 1849 in Italy (Novara).
Elements of strategy.
Passage of rivers illustrated by the passage of the Douro, 1809.
Secondary operations of war.—Out-posts, reconnaissances, detachments, convoys.

Third Term.

Military topography of Spain, and general sketch of the Peninsular war, showing bases and lines of operation.
Massena's retreat, with combats of Redhina, Pombal, &c. to Sabugal.
Campaign of 1812, with battle of Salamanca.
Campaign of 1813, with battle of Vittoria.
Campaign in the Pyrenees, 1813–14, to Sorauren.
Battle of Rivoli.

Fourth Term.

Battle of Orthez, with the operations immediately preceding.
Campaign of 1814 on the Seine and Marne.
Campaign of 1859 in Italy, with action of Casteggio, and battles of Magenta and Solferino.
Passage of the Danube, 1809, with the preceding operations, and battle of Essling.

French.

The instruction consists in reading Molière, Guizot, Scribe, French grammar, explanation of rules.
Dictation from letters, despatches, articles from the Journal des Débats.
Translation from English into French from letters, despatches, passages from history, chiefly from Macaulay and Prescott.
Original composition, letters, reports on any subject the student may choose.
Conversation as frequent as the proficiency of the student allows.

German.

Reading, writing, translations from German to English and English to German, dictation, original composition, and conversation.
The books used are Mr. Demmler's Grammar; Mr. Demmler's Exercises.
German newspaper, and various German books.

Hindustani.

Grammar (Forbes's).
Translation of Hindustani:—
- Selections in Forbes's Grammar.
- Ikhwanu-s Safa.
- Bagh o Bahar.
- (Other text books are occasionally used by advanced students.)
- Proceedings of Courts-martial.
- Manuscript letters.

Writing from dictation.
Translation of English into Hindustani:—
- Exercises in Forbes's Manual.
- Miscellaneous extracts; and from Dictation.

Conversation.

Geology and Mineralogy.

[Text Book: Ansted's Elementary Course.]

I.

I. Introduction. General bearings of the science of Geology.
   1. Value of the knowledge of rocks and minerals; their mode of occurrence, and their uses.
   2. Value of the knowledge of the structure of stratified rocks; their origin, mineral and organic contents, relative position; relation to surface-features, engineering, architecture, drainage and water-supply (natural and artificial), mining, agriculture, and supply of fuel.

II. Study of the Rock-formations. The general arrangements of the stratified and unstratified material of the crust of the earth.

III. The geological structure of the south-east of England.

IV. The method by which the rocks have been formed, as illustrated by natural processes carried on at the present time by rivers, seas, volcanos, &c.

V. Rocks, Stratified and Unstratified, geologically considered.
   1. Limestone and calcareous rocks.
   2. Sandstone and siliceous rocks.
   3. Clays and argillaceous rocks.

4. Slates, schists, and gneiss (metamorphic rocks).
5. Magnesian rocks; dolomite, serpentine, steatite, &c.
6. Granitic and volcanic rocks.
7. Carbonaceous rocks; carbonaceous shale, anthracite and coal, lignite and peat.
8. Metalliferous rocks; bearing zinc, tin, lead, iron, copper, silver, gold, &c.

VI. Study of Minerals; or the constituent materials of rocks, considered mineralogically and with reference to their uses in building, in manufactures, in the arts, &c.

VII. Principles of Mineralogy.

VIII. Characters of Minerals.
Crystallography; crystalline forms, and systems of crystallization.
Structural, optical, electrical, and other characters; odour, taste, hardness, specific gravity; chemical composition of minerals. Analysis by acids, heat, &c.

IX. Minerals:
1. Lime and its compounds: calcite (carbonate of lime), gypsum (sulphate of lime), fluor (fluate of lime), and apatite (phosphate of lime).
2. Silica (quartz, agate flint, &c.)
3. Alumina and its compounds; felspar and clays, mica, garnet, &c.
4. Magnesia and its compounds; meerschaum, talc, &c.
5. Alkaline minerals; nitre, rock-salt, lime (see above), &c.
6. Carbon; diamond, graphite, coal, &c,
7. Metals; gold, silver, copper, iron, lead, tin, zinc, antimony, manganese, aluminium, &c.

II.

I. Study of the Rock-formations with especial reference to their occurrence as Strata or as Unstratified Masses (rocks of aqueous and of igneous origin), and to the relations that the structure of rock-masses bears to surface-features (plains, valleys, gorges, cliffs, table-lands, hill-ranges, hill-rocks, mountains, &c.), to engineering (roads, canals, earthworks, &c.) Drainage, water supply, and mining for coals and metals.

II. The structure of bedded rocks.
Stratification; horizontal, inclined, undulated, and contorted; conformable and unconformable; faulted, overlapping, outlying, and denuded strata. Dip and strike. The clinometer. The formation of hills and valleys. Geological maps and sections.

III. The general relation of the surface to the strata and other rock-masses; dependence of physical geography on geology.

IV. The nature and capabilities of a country better understood when its geological structure is known; and the characters of a new country rapidly recognised and comprehended by a geological traveller or reconnoitrer.

V. Different characters given to different hills by stratification; arched, undulated, flat, inclined and vertical strata.

VI. Relations of hills and valleys with reference to their stratification, illustrated by the valley of the Thames, by the Wealds of Kent, Surrey, and Sussex, and by other districts.

VII. The structure and relations of hill-ranges and gorges, of mountains, and of continents.

VIII. Water-supply, natural and artificial.

IX. Mining for coal and for metals.

III.

I. Study of Fossiliferous Rocks.
The general arrangement of the stratified rocks; their origin, and their contained fossils or organic remains.

II. Sketch of the vegetable and animal kingdoms.

III. The primary strata; Laurentian, Huronian, Cambrian, Silurian, Devonian, Carboniferous, and Permian. Characteristic fossils; graptolites, corals, encrinites, trilobites, fishes, &c.

iv. The secondary strata; Triassic, Rhætic, Liassic, Oolitic, Wealden, and Cretaceous. Characteristic fossils; ammonites, terebratulæ, reptiles, &c.

v. The tertiary strata; Eocene, Miocene, Pliocene. Characteristic fossils; nummulites, sea-urchins, gasteropods, crabs, mammals, &c.

vi. The post-tertiary formations; the glacial period; bone caves; imbedded remains of man and his works.

Chemistry.

First Year. *First Term.*

Lectures on Chemistry.—The metalloids, with especial reference to practical applications.

Laboratory.—Introduction to analytical chemistry. Analysis of simple substances.

Second Term.

Lectures on heat and magnetism.

Laboratory.—Analysis of more complex substances, attention being paid to the use of the blowpipe.

Second Year. *First Term.*

Frictional and voltaic electricity.

Laboratory.—Analysis.—Exercises in various practical operations in chemistry, and natural philosophy.

Second Term.

Miscellaneous lectures.

Laboratory.—Continuation of the preceding half-year's work.

The books recommended are Galloway's Outlines of Qualitative Analysis, Miller's, Graham's or Liveing's Chemistry, Ganot's Elements of Physics.

Wm. Napier, Colonel.

Distribution of Time, Senior Class, Staff College, 11th February 1864.

Days.	9 to 11.	11 to 12.30.	1 to 2.30.	2.30 to 4.
Monday	Laboratory	Geology	Fortification and Artillery.	German.
Tuesday	Mathematics, French.	Military Administration.	Hindustani	Geology Demonstration.
Wednesday	Mathematics, French.	Chemistry Lecture.	Eye Sketching and Road-making.	
Thursday	Military History. 9.30 to 11.	Riding	Hindustani, German.	Fortification and Artillery.
Friday	Mathematics, French.	Riding	Fortification	Fortification.
Saturday	Astronomy, Hindustani.	German	Fortification	Fortification.

Distribution of Time, Junior Class, Staff College, 11th February 1864.

Days.	9 to 11.	11 to 12.30.	1 to 2.30.	2.30 to 4.
Monday	Sect. (*a*) Mathematics, 9 to 10 „ (*b*) French „ (*a*) French „ (*b*) Mathematics, 10 to 11.	Laboratory and Geology	Fortification. 1.30 to 4.30.	
Tuesday	Riding	Sect. (*a*) Mathematics, 11 to 12. „ (*b*) French „ (*a*) French „ (*b*) Mathematics, 12 to 1	Military Topography.	Geology Demonstration.
Wednesday	Riding	Chemistry Lecture	Hindustani.	Fortification. 3 to 4.30.
Thursday	Sect. (*a*) Mathematics, 9 to 10 „ (*b*) French „ (*a*) French „ (*b*) Mathematics, 10 to 11.	Military Administration	Military Topography.	Hindustani, German.
Friday	Military Topography	Military History	German, Hindustani.	Military Topography.
Saturday	Astronomy and Mathematics.	German	Fortification. 1.30 to 4.30.	

Distribution of Time, Senior Class, Staff College, May 1864.

Days.	9 to 11.	11 to 12.30.	1 to 2.30.	2.30 to 4.
Monday	Laboratory	Mathematics, French, 11 to 1.	Practical Instruction. 1.30, Fortification.	
Tuesday	Mathematics, French.	Military Administration.	German	Astronomy. 3.30 to 5.
Wednesday	Mathematics, French.	Military History.	Practical Instruction. Military Topography	
Thursday	Fortification	Riding	Hindustani, Chemistry.	German.
Friday	Geology 9.30.	Riding, Hindustani.	Practical Instruction. 1.30, Fortification.	
Saturday	Astronomy, Hindustani.	Geology	German	Fortification.

Distribution of Time, Junior Class, Staff College, May 1864.

Days.	9 to 11.	11 to 12.30.	1 to 2.30.	2.30 to 4.	——
Monday -	Mathematics, French.	Laboratory -	Fortification	Ground Problems.	—
Tuesday -	Mathematics	Riding -	Practical Instruction. Military Topography.		—
Wednesday	Military Administration.	Riding -	Hindustani, German.	Fortification	Chemistry, Extra Lecture, 4 to 5.
Thursday -	Mathematics, French.	Military History.	Practical Instruction. Military Topography. Chemistry.		—
Friday -	Geology - 9.30.	Mathematics, French.	German -	Hindustani, Astronomy. 3.30 to 5.	—
Saturday -	Astronomy, Mathematics.	Geology - Hindustani.	Fortification	German.	—

Distribution of Time, Senior Class, Staff College, July 1864.

Days.	9 to 11.	11 to 12.30.	1 to 2.30.	2.30 to 4.	4 to 5.
Monday -	Laboratory, Hindustani.	Mathematics, French } 11 to 1.	Practical Instruction.		
Tuesday -	Mathematics, French.	Hindustani - 12 to 1. Riding, 11.30.	Geology -	German.	—
Wednesday	Mathematics, French.	Hindustani - 11.30 to 1. Riding, 11.30.	Fortification	German.	—
Thursday -	Military History. 9.30.	Fortification	German Chemistry.	Practical Instruction.	
Friday -	Military Administration. 9.30.	Reconnaissance.		Reconnaissance.	
Saturday -	Astronomy -	Reconnaissance. Geology.		Reconnaissance.	

Distribution of Time, Junior Class, Staff College, July 1864.

Days.	9 to 11.	11 to 12.30.	1 to 2.30.	2.30 to 4.	4 to 5.
Monday -	Fortification	Laboratory -	Surveying -	Surveying -	Surveying.
Tuesday -	Military Administration. 9.30.	Mathematics, French } 11 to 1.	Geology, Hindustani, German.	Fortification	—
Wednesday	Military History. 9.30.	Fortification	German -	Hindustani	—
Thursday -	Mathematics, French.	Riding - 11.30.	Chemistry -	German, Hindustani.	—
Friday -	Mathematics, French.	Riding - 11.30.	Surveying -	Surveying -	Surveying.
Saturday -	Astronomy -	Surveying - Geology.	Surveying -	Surveying -	Surveying.

Distribution of Time, Senior Class, Staff College, October 1864.

Days.	9.30 to 11.30.	11.30 to 1.	1.30 to 3.	3 to 4.30.
Monday - -	Laboratory, Geology.	German -	Military History.	French.
Tuesday - -	Mathematics -	Hindustani, Riding. 12 to 1.	Geology -	German.
Wednesday -	Mathematics -	Hindustani, Riding. 12 to 1.	French -	Fortification.
Thursday -	Mathematics -	Mathematics, Hindustani.	Chemistry -	—
Friday - -	Mathematics -	Military Administration.	German, Chemistry.*	Fortification.
Saturday - -	Astronomy -	Fortification -	French.	—

The attendance of this Class is entirely voluntary except in Riding, which is obligatory.

* This Lecture will be only temporary.—W.N.

Distribution of Time, Junior Class, Staff College, October 1864.

Days.	9.30 to 11.30.	11.30 to 1.	1.30 to 3.	3 to 4.30.
Monday - -	Geology -	Laboratory -	German -	Hindustani.
Tuesday - -	Mathematics, French.	Military History.	German, Geology.	Hindustani.
Wednesday -	Mathematics, French.	Military Administration.	Fortification -	Hindustani.
Thursday -	Mathematics, French.	Riding - - 12 to 1.	Chemistry -	Fortification.
Friday - -	Mathematics -	Riding - - 12 to 1.	Chemistry * -	German.
Saturday - -	Astronomy -	Plotting . -	Fortification -	Fortification.

* This Lecture will be only temporary.—W.N.

Appendix VII.

Reports of Final Examinations held at the Staff College.
No. 563.

Memorandum by the Council of Military Education.

1, Whitehall Yard, S.W.,
12th December 1860.

The Council of Military Education have the honour to submit, for the information of His Royal Highness the General Commanding-in-Chief, a report of the Final Examination of the Senior Division of students at the Staff College; as also of the Examination of five officers who presented themselves, and were examined with that division, although they had not gone through the College Course, agreeably to Art. 13 of the Staff College Regulations.

The Council beg to call attention to the distinguished Examination passed by Captain Grant, R.E., which, when the diminished number of marks attainable by candidates who present themselves without having gone through the College Course is considered, appears nearly equivalent to that passed by Brevet-Major Whitmore.

Lieutenant Home of the Royal Engineers is also reported by the Examiner to have exhibited a considerable knowledge of those higher subjects of Mathematics which in Art. 17 of the Staff College Regulations are mentioned as required from officers who may desire to prove their fitness for employment on the Ordnance Survey or in the Topographical Department.

Some of the special reports of the Examiners have not yet been received, but those of the Examiners in Military History, Mathematics, Natural and Experimental Sciences, German, and Hindustani express so favourable an opinion that the Council are justified in considering the examination highly satisfactory.

(Signed) R. Rumley, Major-General, V.P.
J. E. Portlock, Major-General.
T. Elwyn, Colonel.
J. E. Addison, Lieut.-Colonel.

Report of the Examination of the Officers of the Senior Division of the Staff College, December 1860.

Order.	Rank, name, &c.	Index No.	Mathematics.			Fortification and Artillery.	Military Art, History, and Geography, with Memoirs.	Military Administration and Legislation.	Military Drawing, Surveying, and Reconnaissance.	French.	German.	Hindustani.	Italian.	Natural Sciences.	Experimental Sciences.	Total.	Remarks.
			One third of Marks obtained at first year's examination.	Present examination.	Total.												
	Maximum - - -	..	200	600	800	600	600	600	700	400	400	400	400	300	300	5,100	Min. in *one* language 200, and in all others 133 marks.
	Minimum - - -	..	..	..	300	300	300	300	350	..	..	..	..	100	100	..	
1	Brevet-Major Whitmore, 62nd - -	16	127	326	453	377	565	524	613	340	262	..	273	271	114	3,792	
2	Capt. A. H. Wavell, 41st - -	26	133	427	560	353	417	491	503	323	253	..	273	254	145	3,552	
3	Lieut. R. Home, R.E. - - -	13	186	492	678	445	534	495	615	251	..	..	47	272	150	3,440	
4	Lieut.-Col. Hon. W. Feilding, Coldstream Guards - - -	15	128	312	440	374	502	455	581	325	282	..	227	139	50	3,325	
5	Capt. R. B. Stokes, 54th - -	21	132	346	478	375	471	436	543	305	150	190	..	188	..	3,136	
6	Brevet-Major A. S. Jones, V.C., 13th -	22	110	317	427	391	530	522	541	232	..	136	..	164	130	3,073	
7	Capt. G. A. Hartman, Unattached -	17	100	341	441	384	473	492	504	273	..	217	..	121	120	3,025	
8	Lieut. R. C. Goff, 50th - - -	28	122	309	431	353	473	479	635	369	276	..	..	..	..	3,016	
9	Capt. N. Goddard, 17th - - -	25	122	370	492	370	456	443	619	216	..	303	..	..	..	2,899	
10	„ H. J. Wilkinson - - -	18	118	237	355	329	438	456	616	271	261	..	140	..	..	2,866	
11	„ W. C. Nangle, R.A. - - -	20	113	344	457	484	424	469	527	271	169	..	..	86	55	2,801	
12	„ P. D. Vigors, 19th - -	23	102	287	389	419	459	528	572	242	..	..	..	162	5	2,771	
13	„ H. F. Morgan, 28th - - -	19	143	315	458	377	411	450	554	235	153	86	..	132	..	2,770	

The above officers are, therefore, prepared to be attached to the arms of the service successively in which they have not previously served, agreeably to Art. 15. of the Staff College Regulations, dated Horse Guards, 23rd January 1860.

OFFICERS who presented themselves for the Final Examination without having gone through the Staff College, December 1860.

Order.	Rank, Name, &c.	Index No.	Mathematics.			Fortification and Artillery.	Military Art, History, and Geography.	Military Administration and Legislation.	Military Drawing, Surveying, and Reconnaissance.	French.	German.	Hindustani.	Italian.	Natural Sciences.	Experimental Sciences.	Total.	Remarks.
			One third of Marks obtained on first year's courses.	Present Examination.	Total.												
	Maximum - - -	..	*200*	*600*	*800*	*440*	*300*	*600*	*220*	*400*	*400*	*400*	*400*	*300*	*300*	*4,160*	Min. in *one* language 200, and in all others 133 marks.
	Minimum - - -	..	..	..	*300*	*220*	*150*	*300*	*110*	..	..	..	..	*100*	*100*	..	
	Capt. R. Grant, R. E. - - -	44	170	497	667	324	260	436	202	362	236	..	300	300	193	3,280	
	„ O. B. B. Woolsey, R. A. - -	43	151	326	477	300	220	509	173	341	..	..	304	..	125	2,449	
3	„ W. T. M. Wolfe, R. A. - -	41	109	231	340	304	260	483	185	206	..	..	..	..	..	1,778	
		42	80	290	370	207	210	450	150	275	..	..	233	..	..	1,688	Failed in Fortification.
		40	82	164	246	176	165	336	210	312	87	..	..	..	..	1,023	Failed in Fortification and Mathematics.

App. VII.
Staff College.

12th December 1861.

The Council of Military Education have the honour to submit to His Royal Highness the General Commanding-in-Chief the Report of the Annual Examination of the Students at the Staff College.

His Royal Highness having decided, on the recommendation of the Council, that on this occasion any officer should be held to pass who fulfilled the requirements of either the old or the new system of marks, the Returns have been drawn out on this principle. Every student of the Senior Division, therefore, has been reported as successful who has obtained either half the marks allotted respectively to the subjects of Mathematics, Fortification, Military Drawing, and Reconnaissance, Military History, Military Administration and Law, and one Foreign Language, or who has obtained the aggregate of 2,500 marks, and proved himself qualified in Military Drawing and Reconnaissance.

The Council are of opinion that the result of the Examination has been on the whole satisfactory.

In Military History the result is reported to be satisfactory, and the Examiner is of opinion that the attention given to this subject has been very good. In the subject of Military Administration and Law, the Council regret to state there is an exception to the otherwise favourable opinion reported by the Examiners of the result of the Examination. There is reason to apprehend that this subject has not received from many of the students that careful attention which, from its great importance to a staff officer, it so fully deserves. The Examiner, however, makes special exception in favour of Brevet-Major Creagh, 86th Regiment. "The papers," he reports, "show "an ample acquaintance with facts, considerable originality and power of "reasoning, with facility and clearness of expression."

In French, the Report is satisfactory, and the Examiner particularly notices the essays in that language of Brevet-Major Turnbull, 13th Regiment, Captain M'Creagh, 4th Dragoon Guards, Captain Battersby, 60th Rifles, and Captain Leggett, 69th Regiment.

The Examiner in Hindustani reports himself well satisfied with the proficiency of the candidates in that language, and particularly instances the papers of Captain Battersby, 60th Rifles, Major Creagh, 86th Regiment, and Major Stewart, 35th Regiment.

Brevet-Major Stewart, 35th Regiment, passed a satisfactory examination in Persian, which he took up as an extra language, in conformity with the Regulations.

In Chemistry, the Examiner notices the papers of Brevet-Major Stewart, 35th Regiment, Captain Stuart, 17th Regiment, and Lieutenant F. W. Hutton of the 23d Regiment, and reports that the knowledge possessed by these candidates in the majority of the subjects discussed by them is sound and accurate.

The Examiners' Reports in the subjects of Fortification and Military Drawing and Reconnaissance have not yet been received; but the Council would specially notice the high marks obtained by Major Creagh, 86th Regiment, in Fortification, and by Captain Battersby, 60th Rifles, in Military Drawing and Reconnaissance.

(Signed) W. Knollys, Lieut.-General, V.P.
J. E. Portlock, Major-General.
T. Elwyn, Colonel.
J. E. Addison, Colonel.

REPORT of the Examination of the Officers of the Senior Division of the Staff College, December 1861.

Order.	Rank, Name, &c.	Index No.	Mathematics.			Fortification and Artillery.	Military Art, History, and Geography, with Memoirs.	Military Administration and Legislation.	Military Drawing, Surveying, and Reconnaissance.	French.	German.	Hindustani.	Italian.	Natural Sciences.	Experimental Sciences.	Total.	Remarks.
			One third of Marks at first year's examination.	Present Examination.	Total.												
	Maximum - - -	..	..	..	800	600	600	600	700	400	400	400	400	300	300	..	In one language 200, in any other language 133.
	Minimum - - -	..	..	..	300	300	300	300	350	..	..	..	..	100	100	2,500	
1	Brevet-Major C. O. Creagh, 86th -	9	132	325	457	511	485	535	564	277	268	270	..	160	210	3,737	
2	Capt. J. P. Battersby, 60th - -	17	145	385	530	472	518	426	638	288	..	328	..	121	165	3,486	
3	„ W. T. Stuart, 17th - -	23	138	300	438	445	555	468	577	244	..	..	210	225	265	3,427	
4	Brevet-Major J. R. Turnbull, 13th -	5	147	350	497	470	500	369	552	338	..	130	220	36	130	3,076	
5	Lieut. F. S. Stoney, R. A. - -	29	162	360	522	403	439	395	138	245	169	142	..	109	175	3,037	
6	„ F. W. Hutton, 23rd - -	31	130	340	470	456	454	326	521	207	..	..	..	243	265	2,942	
7	Capt. R. A. Leggett, 69th - -	21	140	315	455	421	484	440	468	293	..	213	..	..	..	2,774	Has been only one year and a half at college.
8	„ T. E. A. Hall, 49th - - -	27	145	365	510	450	480	355	599	205	..	..	150	..	75	2,749	
9	Brevet-Major R. C. Stewart, 35th* -	7	82	250	332	305	425	261	454	278	..	225	310	120	265	2,714	
10	Capt. G. A. Wilkinson, R. A. - -	13	103	285	388	382	409	292	479	305	298	..	310	..	..	2,571	Has been but one year at college.
11	„ J. S. Swann, 22nd - - -	19	117	360	477	400	435	440	452	222	..	..	..	87	115	2,541	
12	„ G. Hay, 62nd - - - -	15	106	285	391	409	461	405	472	263	..	..	120	92	..	2,401	
13	„ W. E. Lockhart, 26th - -	25	88	300	388	380	445	330	415	210	217	..	..	..	..	2,385	

* Extra Modern Language, Persian, 235.

The above officers are, therefore, prepared to be attached successively to the arms of the service in which they have not previously served (agreeably to Regulations).

App. VII.

Staff College.

REPORT.

13 Great George Street, S.W.,
12th December 1862.

The Council of Military Education have the honour to submit to His Royal Highness the Field-Marshal Commanding-in-Chief their Fourth* Report on the Annual Examination of the Senior Division of Students at the Staff College.

The Students of this Division were examined under the Regulations of 24th of April, 1861.

The result of the Examination generally is very satisfactory, and no officer has failed. Captain Black (who was interrupted in the Topographical study by ill health) has been allowed to complete that course at a more clement season, when his qualification will depend upon the marks obtained by his Reconnaissance Sketch. It is but just to add that this officer, counting the marks already gained on the uncompleted portion of the survey, will attain to the minimum of 2,500.

Captain Colley, who stands first on the list, joined the college in February 1862, and has completed his course with great credit in twelve months.

Captain Elles, having been detained in India on Court-martial duty, joined the college in May 1861, and thus passed in little more than three terms.

In *Military Drawing* there are some very good examples of proficiency, and the examiner reports this class as well advanced.

The Examination sketches of Captains Colley and Elles are specially mentioned as of considerable merit.

In *Mathematics*, some students have passed extremely well, and all creditably —affording proofs of considerable application and ability on the part of those examined.

Astronomy.—This subject, for which under the rules of 1861 no marks are given, was only taken up by one officer, Captain Colley. The examiner reports that the answers show a very intelligent acquaintance with the subject, and would have gained full marks.

The *French* Examinations exhibit a great amount of merit, whether with regard to the accuracy of writing from dictation, fluency of speaking, or translation. The examiner points out Captain Nangle's acquaintance with the language as representing a high standard of attainment; adding, "there is nothing English in his French, and his letter would do credit to an officer of the French Army writing in his own language."

The Examination in *Italian* calls for no special remarks.

German.—The Examinations in German are considered on the whole satisfactory, and nearly all the students exhibited a fair, some a very good, knowledge of that language.

Hindustani.—These Examinations were also considered very satisfactory; the questions, it is true, were easier than those given last year, but they were sufficiently difficult to show considerable attainments on the part of some of the candidates.

Experimental Sciences.—The examiner reports that, with two or three exceptions, the Experimental Sciences appear to have been studied too hastily, without their general principles being mastered; and he hopes that the new scheme of studies will remedy this defect.

Military Administration and Legislation.—These Examinations have been, on the whole, very satisfactory; the examiner calls the attention of the Council in an especial manner to Captain Colley, who, though he only joined the college in Februbry 1862, has obtained the highest number of marks.

The Council being unable to find an officer willing to undertake the duties of independent examiner in this subject, the Examinations were conducted by the Professor of the Staff College.

The Examination in *Military History* is considered a fair average one, the marks ranging from $\frac{1}{2}$ to $\frac{4}{5}$ of the maximum.

(Signed) F. W. Hamilton, Major-General, V.P.
F. Abbott, Major-General.
T. Elwyn, Colonel.

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* N.B.—The previous Reports were not published.

REPORT of the Examination of the Officers of the Senior Division, Staff College, December 1862.

Order of Merit.	Rank and Name.	Regiment.	Index No.	Mathematics.			Fortification and Artillery.	Military Art, History, and Geography, with Memoirs.	Military Administration and Legislation.	Military Drawing, Surveying, and Reconnaissance.	French.	German.	Hindustani.	Italian.	Spanish.	Natural Sciences.	Experimental Sciences.	Total.	Remarks.
				One-third of Marks at first year's examination.	Present examination.	Total.													
		Maximum -		..	*600*	..	*600*	*600*	*600*	*700*	*400*	*400*	*400*	*400*	*400*	*300*	*300*	..	*200 in one language, 133 in any other.
		Minimum -		..	*300*	..	*300*	*300*	*300*	*350*	*	*	*	*	*	*100*	*100*	*2,500*	
1	Capt. G. P. Colley - -	2nd Foot -	9	189	504	693	488	524	527	693	349	310	..	195	..	253	242	4,274	Capt. Colley passed also a very satisfactory examination in Astronomy.
2	Lieut. J. T. Barrington -	R. A. - -	13	147	357	504	504	501	477	653	331	287	..	160	..	141	183	3,741	
3	„ J. P. Nolan - -	R. A. - -	12	145	471	616	446	494	512	493	271	..	..	..	310	244	265	3,651	Only one year at the College.
4	„ C. J. East - -	82nd Foot -	8	143	374	517	473	467	482	613	363	297	224	..	..	196	68	3,632	
5	Capt. S. S. Windham -	Rifle Brigade	14	152	409	561	402	459	465	543	290	..	299	290	..	139	123	3,571	Absent, sick, during April and May 1862.
6	„ J. D. Baker - -	18th Foot -	6	148	430	578	401	391	436	521	305	251	290	..	..	162	113	3,448	
7	„ W. K. Elles - -	38th Foot -	11	180	491	671	483	491	428	674	345	..	..	..	..	164	148	3,404	Joined the College in May 1861.
8	„ A. G. Griffiths -	63nd Foot -	5	127	305	432	406	458	449	475	309	..	304	245	..	202	80	3,280	Qualified.
9	„ C. Parsons - -	3rd Foot -	7	145	300	445	458	436	485	528	294	..	..	285	..	113	115	3,159	
10	„ C. Acton - -	51st Foot -	10	102	301	403	393	433	441	437	213	230	191	..	..	126	125	2,992	
11	Brevet-Major W. W. Lynch	2nd Foot -	28	..	..	..	374	446	412	556	332	240	..	160	..	131	68	2,651	
12	Capt. T. Gonne - -	17th Lancers	26	..	..	..	358	428	428	492	320	224	..	155	..	100	123	2,628	
13	„ H. Nangle - -	15th Foot -	27	73	..	73	371	373	402	445	382	200	..	..	225	101	18	2,572	
	Capt. W. Black (*a*) - -	6th Foot -	29	..	..	..	437	460	465	229	290	337	..	..	200	165	123	2,477	This Officer having been prevented by ill-health from making the Reconnaissance sketch, the final report upon his qualification is deferred.

F. W. HAMILTON, Major-General, Vice-President.
F. ABBOTT, Major-General
T. ELWYN, Colonel.

(*a*) Captain Black was reported qualified in the following year.

App. VII.
Staff College.

REPORT.

13 Great George Street,
11th December 1863.

The Council of Military Education have the honour to forward to His Royal Highness the Field-Marshal Commanding-in-Chief their Report of the Final Examination of the Senior Division of Officers at the Staff College.

The Council are happy to report that all the officers have passed, and are now ready to go through their course of practical instruction in the branches of the service in which they have not previously served.

The Examiner in *Mathematics* reports that several students are elegant and accurate computers in questions where logarithms are employed to bring out the results of Trigonometry and Mensuration.

In the Physical subjects the students seem to want more extensive practice in examples, than they have yet had under the claims of other studies on their time.

The Professor of *Mathematics* at the College, who examined in *Practical Astronomy*, reports that the results were generally "satisfactory," and that Lieutenant the Hon. C. E. Edwardes displayed in his answers a very thorough knowledge of the subject so far as it is taught in the Staff College.

The Professor further reports that Lieutenant Hozier passed a very good examination both in Practical Astronomy and in Geodesy, and the Council have pleasure in recomending that officer, in accordance with Art. 17 of the Staff College Regulations, as deserving of employment in the Ordnance Survey or in the Topographical Department.

In *Fortification* the examiner reports the results of the Examination to be in general satisfactory, with the exception of the answers relating to the construction of Military Bridges, which, he reports, showed in few cases any serviceable knowledge.

In *Military Topography* the examiner reports that the work produced was "satisfactory," and that many of the sketches were "very fairly executed in all respects." He specially mentions No. 12 (Captain Beazley) as an "exceedingly good Draughtsman."

In *Military History* the examiner specially distinguishes the papers of No. 22 (Lieutenant Hozier).

In *Military Administration and Law* the examiner states the result to have been "very satisfactory," and he draws attention to the papers of No. 24 (Lieutenant Hon. C. E. Edwardes), No. 16 (Captain Adair), No. 22 (Lieutenant Hozier), and No. 28 (Lieutenant Arbuthnot).

In *French* the examiner reports very favourably on the results of the Examination, both as regards Translation and Conversation, and more particularly the Essay in French. He makes special mention of No. 2 (Captain Harbord) and No. 8 (Captain Horne) for their Essay in that language.

The Examiner in *German* reports that the Examination was satisfactory, particularly as regards Conversation, but that the written part of the Examination was not equal to the *vivâ voce*.

In *Hindustani*, the examiner reports that the average of proficiency is not so high at this as at the last Examination.

The Examiner in *Italian* reports that the papers in that language were upon the whole "very satisfactory."

In *Experimental Sciences* the examiner calls attention to the satisfactory results of the Examination, and mentions the papers of No. 6 (Captain Law) and No. 12 (Captain Beazley) as specially deserving of praise.

The Examiner in *Geology* reports the answers to have been, "for the most part, very full and satisfactory."

The Council have great pleasure in drawing the attention of His Royal Highness to the very satisfactory character of this Examination.

(Signed) F. W. Hamilton, Major-General, V.P.
F. Abbott, Major-General.
T. Elwyn, Colonel.
J. E. Addison, Colonel.

Postscript.

The Final Report upon Capt. W. Black, 6th Foot, having been deferred* till he had completed his Reconnaissance Sketch, the Council have now to report that the total number of marks gained by that Officer in Military Drawing, &c. is 464, making his aggregate of marks 2,941, and that he is therefore qualified.

(Signed) F. W. Hamilton.

* See Council's Report on Final Examination at the Staff College, December 1862.

REPORT on the Officers of the Senior Division of the Staff College who were examined in December 1863, under the Rules of 1861.

Order of Merit.	Rank and Name.	Regiment.	Index No.	Mathematics.			Fortification and Artillery.	Military Art, History, and Geography, with Memoirs.	Military Administration and Legislation.	Military Drawing, Surveying, and Reconnaissance.	French.	German.	Hindustani.	Italian.	Natural Sciences.	Experimental Sciences.	Total.	Remarks.
				One third of Marks at first year's examination.	Present examination.	Total.												
		Maximum -		200	600	800	600	600	600	700	400	400	400	400	300	300	5,100	*Obligatory. †In one language 200, in any other language 133.
		Minimum -		..	..	300	300	300	300	350*	†	†	†	†	100	100	2,500	
1	Lieut. H. M. Hozier -	2nd Life Gds.	22	181	441	622	519	571	542	562	325	170	..	300	270	240	4,121	Recommended for employment on the Ordnance Survey, or in the Topographical Department. Specially mentioned by Examiners in Geodesy, Military History, Military Administration, and Law. Passed also an excellent examination in Modern Greek, a very good examination in Danish, and fairly in Spanish.
2	Capt. A. S. Adair - -	13th Foot -	16	161	303	464	467	464	550	563	342	..	219	280	185	..	3,534	Specially mentioned by Examiner in Military Administration and Law.
3	Lieut. A. L. Emerson -	28th Foot -	20	144	302	446	439	469	497	503	251	..	..	230	240	215	3,290	
4	Capt. H. A. Brett - -	43rd Foot -	14	154	309	463	453	407	515	512	185	..	264	150	..	190	3,139	
5	Lieut. W. L. K. Ogilvy -	60th Rifles -	26	157	329	486	506	427	442	552	225	243	..	..	195	..	3,076	
6	„ J. J. N. Buchanan -	6th Drag. Gds.	18	100	99	199	445	413	446	498	345	228	201	..	210	225	3,011	
7	Capt. E. G. Horne - -	25th Foot -	8	100	206	306	436	443	494	516	325	..	..	200	150	..	2,870	Specially mentioned by Examiner for Essay in French.

REPORT on the Officers of the Senior Division of the Staff College who were examined in December 1863, under the Rules of 1862.

Order of Merit	Rank and Name	Regiment.	Index No.	Mathematics.			Fortification.	Military Drawing, Surveying, and Reconnaissance.	Military History.	Military Administration and Law.	French.	German.	Hindustani.	Experimental Sciences.	Total.	Remarks.
				First Year.	Practical Astronomy.	Second Year.										
		Maximum	..	300	200	400	600	700	600	600	400	400	400	400	4,200	*Obligatory.
		Minimum	..	..	..	..	300	350*	300	300	..	..	..	..	2,500	
1	Lieut. Hon. C. E. Edwardes	Rifle Brigade	24	271	155	314	553	579	519	528	213	..	..	354	3,486	Specially mentioned by Examiners in Practical Astronomy and in Military Administration and Law.
2	Capt. F. T. A. Law	Royal Artillery	6	280	129	330	552	561	460	409	236	..	..	383	3,430	Specially mentioned by Examiner in Experimental Science. Has been only 3½ Terms at the College.
3	„ G. G. Beazley	83rd Foot	12	242	121	232	485	646	443	479	282	..	..	388	3,318	Specially mentioned by Examiners in Experimental Science and in Military Topography.
4	„ R. Harbord	7th Foot	2	225	118	229	518	502	492	512	340	..	..	371	3,307	Specially mentioned by Examiner for Essay in French.
5	„ R. C. Healy	16th Foot	4	249	118	216	454	588	508	500	223	105	..	..	2,961	Has been only 3 Terms at the College.
6	Lieut. W. Arbuthnot	14th Hussars	28	137	119	194	471	576	487	530	220	..	215	..	2,949	Has been one year only at the College. Specially mentioned by Examiner in Military Administration and Law.

App. VII.

Staff College.

Memorandum by the Council of Military Education.

13 Great George Street, S.W.,
12th December 1864.

The Council of Military Education have the honour to forward to His Royal Highness the Field-Marshal Commanding-in-Chief their Report of the Final Examination of the Senior Division of the officers of the Staff College.

All the officers have passed, and are now ready to go through their course of practical instruction in those branches of the service in which they have not already served.

The Examiner in Mathematics reports a visible improvement since he last examined in 1862 in the manner in which the papers have been done; the Papers of No. 6 (Captain Hutchison, 64th Regiment) being "really first-rate."

The Professor of Mathematics, who examined in Astronomy and Geodesy, reports that Captain Hutchison's answers show a thorough comprehension of the subjects so far as they are taught in the Staff College. As Captain Hutchison has high qualifications in Military Topography also, the Council have much pleasure in recommending that officer, in accordance with Article 17 of the Staff College Regulations, as deserving of employment on the Ordnance Survey or in the Topographical Department.

In Military History the examiner reports that the majority of the papers are very creditable, and display a good general knowledge of the campaigns under consideration, but that they do not sufficiently master the details; and he remarks that the best plan drawers are generally the most accurate in their details. He specially notices Nos. 1, 4, and 6 (Lieutenant-Colonel Clive, Captain Hutchison, and Brevet-Major Goodenough).

In Military Administration and Legislation the examiner considers that the questions have, on the whole, been very fairly answered. The papers of Nos. 3, 4, and 12 (Brevet-Major Bolton, Brevet-Major Goodenough, and Lieutenant Young), on Military Administration, show a very good acquaintance with that subject, besides extensive reading, and facility of composition.

In French the examiner considers the result to be highly gratifying; sound learning is more generally diffused than usual. Some of the Essays are distinguished for neatness, fluency, and command of language; and the translation of English into French has been achieved with great success in some cases.

The Examiner in German considers the result to be very satisfactory. The English and German translations, and the grammatical questions, were done by all the students in a very respectable manner, and by some remarkably well.

The very important subject of Reconnaissance has, at the suggestion of the Commandant, been undertaken this year upon an enlarged scale. The officers of the Senior division, formed into four parties, reconnoitred the country between Aldershot and the south coast, under the immediate direction of Colonel Napier. The Reconnaissance commenced on the 19th September, and was completed on the 28th idem, during which period

345 miles of road,
21 positions, and
24 miles of sea-coast

were sketched and reported upon.

In submitting his Report upon this work the Commandant observes: "I "have every reason to be satisfied with the zeal shown by the officers employed "upon this duty, with but two exceptions;"—and in speaking of the several reports and drawings made by the officers he says "Pre-eminent among them "in point of excellence are the drawings of Captain Creagh; his reports also "are clear and judicious.

"Captain Hutchison's work comes next; his drawings are very neatly "executed, and his reports are good.

"Major Goodenough's drawings are very creditable.

"Captain Gilbard's sketches are very neat, and his reports are good.

"Captain Knowles, in consequence of an accident, was only able to traverse "roads. These are well done, and his reports are good.

"Lieutenant Fawcett's sketches are neatly executed, and his reports are very "fair."

The Examiner in Fortification and Surveying reports as follows :—

"The results of the examination in Fortification of the officers at the Staff College are generally satisfactory, but in the question on scales the average decimal gained by the Senior division is only ·41, a large proportion of the replies being either inaccurate in construction or quite incorrect."

"The replies in Artillery were for the most part very good."

"The work of No. 4 (Brevet Major Goodenough), in Fortification, Military Mining, Military Bridging, and Artillery, merits especial notice."

"In the Survey Examination the results are also satisfactory. The work of Captain Creagh shows considerable aptitude for Military Sketching."

In Hindustani the proficiency is considered to be higher than at any previous examination. The examiner especially distinguishes Nos. 5 and 12 for composition, for a very extensive acquaintance with the vocabulary of the language, a knowledge of its peculiar idioms, and a facility of conversation.

One officer (Lieutenant Young) took up Persian, and he is reported upon favourably by the examiner.

In Experimental Sciences the examiner considers the senior class to have passed a very satisfactory examination, the answers showing signs of careful as well as intelligent study.

In Natural Sciences the Examiner reports, on the whole, favourably. He considers Nos. 3 and 4 (Brevet-Major Bolton and Brevet-Major Goodenough) to have shown a more extensive acquaintance with the subject than can generally be expected from students with but a limited time at their command.

The following officers took up extra subjects for honours :—

Lieutenant-Colonel E. H. Clive.—French.
Bt.-Major W. H. Goodenough.—French, Spanish, and Italian.
Captain F. J. Hutchison.—Higher Mathematics.
Lieutenant H. W. Young.—French, Italian.
Lieutenant L. O. B. Blake.—German, Italian, and Hindustani.

The Council consider the results of the examination of the Senior Division to be eminently satisfactory.

(Signed) F. W. Hamilton, Major-General, V.P.
F. Abbott, Major-General.
T. Elwyn, Colonel.
J. E. Addison, Colonel.

Report of the Examination of the Officers of the Senior Division of the Staff College, December 1864.

Order.	Rank, Name, &c.	Index No.	First Year.	Practical Astronomy.	Second Year.	Fortification and Artillery.	Military Drawing, Surveying, and Reconnaissance.	Military History.	Military Administration and Law.	French.	German.	Hindustani.	Natural Sciences.	Experimental Sciences.	Total.	Remarks.
	Maximum	..	300	200	400	600	700	600	600	400	400	400	400	400	..	
	Minimum	..	..	..	..	300	350*	300	300	..	..	..	..	..	2,500	*Obligatory.
1	Capt. F. J. Hutchison, 64th Foot	6	267	174	384	515	547	519	498	354	..	..	..	357	3,615	Recommended for employment on Ordnance Survey or in Topographical Department. Specially mentioned by examiners in Geodesy and Topography, in both the ordinary and the higher course of Mathematics, in Practical Astronomy, Reconnaissance, and in Military History.
2	Brevet-Major Goodenough, R. A.†	4	245	134	319	532	573	512	534	..	292	..	352	..	3,493	Specially mentioned by examiners in Military Administration, in Reconnaissance, in Natural Sciences, in Fortification, Artillery, and Military History.
3	Capt. J. Creagh, 1st Bn. 5th Foot	7	212	127	268	527	670	447	475	358	..	..	..	328	3,412	Specially mentioned as first in order of merit in Reconnaissance, and specially mentioned by examiners in Military Surveying and Military History.
4	Lieut.-Col. E. H. Clive, 3d Gren. Gds.‡	1	178	141	256	475	544	518	504	..	225	..	286	..	3,127	Specially mentioned by examiner in Military History.
5	Brevet-Major W. J. Bolton, R. A.	3	185	114	233	518	482	428	529	259	..	..	327	..	3,075	Specially mentioned by examiners in Military Administration and in Natural Sciences.
6	Major E. Bowen, 69th Foot	2	206	148	278	445	585	396	437	278	..	..	..	293	3,066	
7	Capt. G. J. Gilbard, 16th Lancers	10	183	..	303	508	547	436	490	264	..	..	188	..	2,919	Specially mentioned in Reconnaissance.
8	Lieut. H. W. Young, 17th Lancers	12	..	..	..	460	538	454	495	..	Persian. 346	361	253	..	2,907	Specially mentioned by examiners in Military Administration and in Hindustani.
9	„ L. O. B. Blake, 2d Bn. 5th Foot§	13	196	95	241	444	455	401	410	345	..	..	232	..	2,819	
10	Brevet-Major H. E. Wood, V.C., 73d Foot	5	..	..	..	427	493	438	486	317	German. 271	353	..	..	2,785	Specially mentioned by examiner in Hindustani.
11	Capt. H. B. H. Blundell, 2d Gren. Gds.	8	131	100	169	421	472	400	475	357	..	..	203	..	2,728	
12	Lieut. J. H. Fawcett, 1st Foot	11	125	83	203	453	544	429	453	243	..	..	189	..	2,722	Specially mentioned in Reconnaissance.
13	Capt. G. B. Knowles, 67th Foot	9	..	..	..	500	413	437	464	349	248	..	229	..	2,640	Specially mentioned in Reconnaissance.

† Passed a superior examination in French, and a fair examination in Italian and Spanish, as extra subjects.
‡ Passed a good examination in French as an extra subject.
§ Passed a fair examination in Hindustani as an extra subject.

(Signed) F. W. Hamilton, Major-General, Vice-President.
F. Abbott, Major-General.
T. Elwyn, Colonel.
J. E. Addison, Colonel.

Appendix VII.

Examination Papers.—Staff College, December 1864.

Senior Division.

Mathematics.—Rev. Canon Heaviside, M.A.

I.—*Heights and Distances.*

(1.) Explain the following terms; vertical line, vertical plane, horizontal plane, angle of elevation, angle of depression, dip of the horizon.

(2.) In a right-angled triangle ABC, C the right angle, given BC=36·25 feet, AC=42·15 feet; solve the triangle.

(3.) In a triangle in which each angle of the base is double of the third angle, given the base 100 feet; solve the triangle.

(4.) Given the three sides of a plane triangle, 50·25 feet, 40·5 feet, 29·75 feet; find the greatest angle.

Is there any formula for determining the angle in terms of the sides that it would be unadvisable to use in this case?

(5.) The angle of elevation of a tower 400 feet high when due north of an observer was 55° 14′; what will the angle of elevation be when the observer has walked 720 feet due east, on the horizontal plane?

(6.) A railroad, AB, runs north, and a railroad, AC, north-east from A. A train starts from A along AB with a velocity of 25 miles an hour; after half an hour a train starts from A along AC with a velocity of 30 miles an hour; find the distance of the two trains from each other, three hours after the first train has started.

(7.) From a boat on a river, the angle of elevation of the top of a column on the bank was observed to be 32° 15′, and the angle subtended by the top of the column and a barge down the river was 48° 12′; after sailing past the column towards the barge for a distance of 480 yards, the observer in the boat found that the angle subtended by the top of the column and the first position of the boat was 20° 26′; find the height of the column.

(8.) A person wishing to determine the length of an inaccessible wall places himself due south of one end and then due west of the other, at such distances that the angle which the length of the wall subtends at each station is 30°; find the length of the wall, the distance between the stations being 120 yards.

(9.) Four points, A, B, C, D, are in the same horizontal plane; if the distance CD be known, show how to determine the distance AB by means of angles measured at A and B.

Senior Division.

II.—*Statics and Dynamics.*

1. Examine and illustrate the following general principle: "The number of "units of work yielded by any agent in a given time is the true measure of "its efficiency or working power."

A weight of three tons is to be raised from a depth of 50 fathoms in one minute; determine the horse-power of the engine capable of doing the work.

2. If P, Q, R be three pressures in equilibrium about a point A in one plane, establish the relation

$$R^2 = P^2 + Q^2 + 2PQ \cdot \cos PAQ.$$

Two forces which are to each other as $2 : \sqrt{3}$ when compounded together give a resultant 1; find the angle at which the forces are inclined to each other.

3. Show how the moment of a force with respect to a point may be represented by an area; prove that the moment of the resultant of any two pressures, whose directions are not parallel, is equal to the algebraical sum of the moments of those pressures with respect to that point, taking a case when all the moments are *not* positive.

4. Find the centre of parallel pressures of any system, all the pressures acting on a plane.

Art. VIII. Staff College.

Hence show that every system of heavy particles has one and only one centre of gravity.

Squares are described on the three sides of a right-angled isosceles triangle; prove that the distance of the centre of gravity of the whole figure, including the triangle, from the hypothenuse c, is equal to $\frac{c}{54}$.

5. If a surface be described by the revolution of a plane curve round a fixed axis, show how to determine the area of the surface described.

It being given that the surface of a sphere is equal to the area of four great circles of a sphere, find the centre of gravity of the arc of a semicircle.

6. When one rough surface rests upon another, explain what is meant by the angle of resistance; and show how it may be determined for two substances.

A mass of wrought iron weighing 500 pounds rests on a plane of oak inclined at an angle of 20 degrees to the horizon, a pressure acts at an angle of 12° to the plane to pull the weight up the plane, and it is in a state bordering on motion; find the pressure, it being given that the limiting angle of resistance for wrought iron upon oak is 31° 50′.

7. A wheel and axle weigh 1 cwt., the radius of the wheel is 2 feet, of the axle 6 inches, of the diameter of the axis 1 inch, and the angle of resistance for the axis and its bearing is 5° 40′; find the magnitude of the weight hanging from the circumference of the wheel which will just support a weight of 1,000 pounds hanging from the circumference of the axle.

8. Define a parabola, its axis, directrix, latus rectum. Show that the tangent at a given point of a parabola bisects the angle between the focal distance and the perpendicular drawn from that point on the directrix.

6. How is accelerating force estimated in Dynamics? If a body be projected vertically downwards with a given velocity, find the space it will describe in a given time by the action of gravity.

If the initial velocity be 64 feet per second, find the space the body will descend *in vacuo* in the fifth second, the force of gravity being taken at 32 feet.

10. If a heavy body be dragged up an inclined plane, show that the units of work expended will equal the number that would be expended in dragging it along the base supposed equally rough, and in lifting it up the perpendicular height.

A train weighs 40 tons, the friction is 7 pounds a ton; determine the horse-power of the engine that will draw the train 4 miles in 10 minutes with a uniform velocity up an inclined plane that rises 1 foot in 200.

Senior Division.

III.—*Mechanics and Hydrostatics.*

(1.) Explain generally how to determine the amount of pressure produced on the summit of a wall that supports an isosceles roof.

A roof weighs 25 pounds per square foot, the pitch of which is 60°, the distance between the walls is 30 feet; determine the magnitude of the pressure on the wall at the extremity of a rafter, the rafters being 5 feet apart.

(2.) Find the time of flight of a projectile on an inclined plane passing through the point of projection.

If there are two inclined planes, and the angle between them is bisected by the horizontal plane, and if the times of flight on the two inclined planes are (t_1) and (t_2), and on the horizontal plane (t), prove $t_1 + t_2 = 2t$, the velocity and angle of projection being the same in each case.

(3.) Explain the construction of the common cycloid; and show how to cause a point suspended by a perfectly flexible string to oscillate in a cycloid.

(4.) Show how to find the number of oscillations which a seconds' pendulum will lose in a day when lengthened by a given small quantity; apply the result when the pendulum is increased by ($\frac{1}{100}$)ths of its length.

(5.) How is the work accumulated in a moving body estimated?

A train is moving at the rate of 40 miles an hour when the steam is turned off; how far will it ascend an incline of 1 in 100, taking the friction at 8 pounds the ton?

(6.) How is the fluid pressure at any point of a rigid surface in contact with the fluid estimated (1) when the pressure is constant? (2) when variable?

A piston has a radius of 4 inches and is in contact with steam on its under surface, exerting a pressure of 30 pounds on the square inch; find the pressure downwards on the piston necessary to keep it at rest.

(7.) What is the centre of pressure on any plane surface immersed in a heavy fluid? Show how to find it when the surface is a rectangle, one side of which is horizontal, and coincident with the surface of the fluid.

(8.) What distinctive property is there between liquids and gases?

If V be the volume of a gas at a temperature (t), and V′ the volume at a temperature (t'), investigate the formula $V' = V \frac{460 + t'}{460 + t}$.

If 200 cubic inches of gas, whose temperature is 60° and pressure 30 inches, be raised to 280°, and its pressure reduced to 20 inches, calculate its volume.

(9.) Explain the action of the common suction-pump; and show what is the theoretical limit of the height to which water can be raised by it.

If the diameter of the piston be 2 inches, and the height of the water in the head of the pump be 24 feet above the well, what pressure does the piston bear?

Senior Division.

Field and Permanent Fortification.—Lieut.-Col. Scott, R.E.

N.B.—When no scale is named, hand-sketches only are required.

1. Construct a scale of metres $\frac{1}{150}$.

The metre = 1·0936 yards.

2. Draw the profile of a work to be hastily thrown up on level ground. Command 5 feet 6 inches; thickness of parapet 6 feet 6 inches; superior slope $\frac{1}{6}$; no berm; slope of escarp $\frac{1}{1}$; slope of counterscarp $\frac{2}{1}$, meeting at bottom; an inside ditch, 5 feet wide at bottom, and 7 feet 6 inches below crest; reverse slope of inside ditch $\frac{1}{1}$; base of interior slope 1 foot. An allowance of $\frac{1}{10}$ to be made for increase of volume.

Scale, 10 feet to 1 inch.

3. Estimate the working party necessary to construct 100 yards of parapet of the above profile in the shortest time; and draw a rough diagram, showing, in plan, how you would distribute the workmen.

4. Draw a diagram showing, in plan and section, some Trous-de-loup; and state the positions for which they are most applicable.

5. Draw a rough diagram of a village, and show how you would intrenc it, taking care to illustrate in your arrangements the following points:—

Hedges which should be destroyed or preserved.

The employment of loopholed walls and earthen intrenchments.

The use of tambours.

The use of abattis, of entanglements and barriers.

Internal communications.

The value of a keep.

6. What advantages have full bastions over empty ones? Draw a diagram of a bastion provided with a cavalier, and with a retrenchment cut through its parapet.

7. Draw a diagram showing the lines you would trace out in order to commence an elevated siege battery for 5 guns and 2 mortars; one end of the battery to be terminated with an epaulement, and the battery to be properly protected with traverses.

8. What are the advantages and defects of sunken siege batteries? Draw a section through one.

9. In what respects do the profiles of parallels and zigzags of approach generally vary?

10. Draw a plan and section of portion of a parapet revetted with sand bags.

App. VIII.
Staff College.

Senior Division.

Artillery.—Lieut.-Col. Scott, R.E.

1. Explain why windage is necessary in smooth-bore guns; and mention the disadvantages arising from it.

2. State the principles which should regulate the length of the bore and the external form of smooth-bore guns.

3. Explain the causes which lead to the use of smaller charges with rifled guns than with smooth-bores; and compare the advantages and defects of the two forms of weapon.

4. Describe briefly the salient features of Armstrong's breech-loading multigroove and shunt-guns, and of Whitworth's and Lancaster's modes of rifling.

5. Mention the more special applications of the following projectiles, stating the conditions favourable to their use, viz., grape, canister, common shells, shrapnel shells, and round shot.

6. What are the special objects supposed to be gained by the use of hollow shot?

7. Explain the principles to be observed in the construction of gun-carriages, in order to lessen the destructive effect upon them from the discharge of the piece.

8. Explain the construction of a siege gun-carriage as respects firing and transport; the elevation or depression allowed to the gun, and the height of the piece above the ground.

9. Explain the method of forming a breach in a masonry wall at a short range.

10. Describe the comparative effects of using cast iron, wrought iron, and steel projectiles upon iron plates.

11. What are the considerations which should influence the selection of horses and of gunners for batteries of position?

12. Explain the disposition which should be made of artillery of different descriptions; 1st, in defending an intrenched position; 2d, in forcing a passage across a river.

13. What is the formation of ground which most favours artillery fire? and what that which most interferes with its accuracy?

14. In what positions would you place your artillery when the line occupied is a short one, and both wings are undefended by obstacles? What variation would you make in the arrangement if one of the flanks were well protected, and the line were one of considerable length?

Senior Division.

Military Mining and Military Bridges.—Lieut.-Col. Scott, R.E.

1. Describe the two methods used in lining galleries. What is the greatest descent you would give a gallery?

2. Explain how mines are tamped; and mention some expedient for increasing the resistance of earthen tamping.

3. What would be the charge for an ordinary mine in common earth if the charge be placed nine feet below the surface?

4. State what you know of the comparative value of the modes of ignition for mines by voltaic battery and frictional electricity, so far as our present experience extends.

5. An arch of a brick bridge, span 35 feet, rise (the arch being the segment of a circle) 10 feet, thickness of the arch at the crown 2 feet 6 inches, is to be destroyed. Show how you would attack it leisurely, and also in haste. Assume the roadway to be level and the depth of the road-material over the crown of the arch to be 1 foot 6 inches. The charges to be stated.

6. Show, with the assistance of diagrams, the form of those parts of a river where fords would be most likely to be found, explaining why it is so.

Illustrate also the positions in which you would seek for fords in the following cases, explaining your reasons:—

1st. Near bridges in rapid rivers.
2d. Near bridges in sluggish rivers.
3d. At the mouth of rapid rivers.
4th. At the mouth of sluggish rivers.

7. What are the positions for which trestle bridges are most suitable? Explain the mode of action of flying bridges, and under what circumstances they may be used with advantage.

8. Explain why a beam fixed at both ends will carry greater weight than one supported only at the ends. What breadth would you give a beam of fir, 8 inches deep and 15 feet between the points of support, if it had to carry a weight of 3 tons distributed equally over its length?

9. How many 72-gallon casks would you require to form a raft to carry 30 men?

Make due allowance for the weight of casks and of superstructure; suppose the men to be in light marching order; and show the figures and assumed data by which you arrive at your conclusion.

Senior Division.

I.—Military History.—Captain J. P. Battersby, 60th Rifles.

1809.

1. With what object was the expedition to Walcheren undertaken? Give the approximate strength of the forces employed (naval and military). What do you consider were the chief causes of its comparative failure and disastrous issue?

2. Sketch the valley of the Danube from Ratisbon to Presbourg, and explain Napoleon's dispositions for an advance on Vienna by the right bank, showing how he secured his flanks and rear from the Austrian corps in Bohemia and the Tyrol.

3. Enumerate the chief difficulties to be overcome in the passage of a great river in the presence of an enemy; and give an account of Napoleon's preparations for the second passage of the Danube on the 4th July 1809.

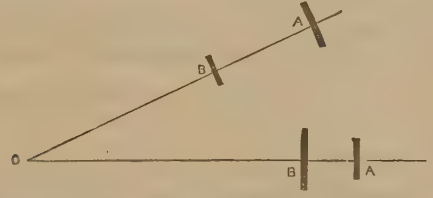
1812.

4. Describe in detail the operations of Wellington and Marmont before Salamanca between the 20th and 24th June, with criticisms upon Marmont's movement to the left of the Tormes.

5. Describe Marmont's passage of the Douro on the 16th and 17th July, and the subsequent operations of both armies between the 17th and 20th July; and give a critical summary of the result by a reference to their relative positions on the evening of the 20th.

1814.

6. An army A is advancing in two corps upon the point O by two converging lines of operations. B retards his progress by holding in check one corps with



a fraction of his force, while he falls with his mass upon the other. At what point in his retreat will this mode of operation be no longer practicable to B? and at what period of the campaign of 1814 was this point reached by Napoleon?

7. AB is the strategical front of an army falling back on X, intersected at right angles by a river with bridges at *d* and *e*. How may the army on

App. VIII. Staff College.

AB best use the river to retard the advance of the enemy? and point out how Napoleon overlooked the value of the Aube in taking up a position at La Rothière.

Senior Division.

II.—Military History.—Captain J. P. Battersby, 60th Rifles.

1796.

1. Point out the chief disadvantages of a double line of operations; and show how Moreau sacrificed the advantages of his position with reference to Jourdan by his movements subsequent to the battle of Neresheim.

2. Illustrate the decisive character of all operations conducted against an adversary's "line of communication," by a reference to Jourdan's position after the battle of Amberg, and his subsequent movements in retreat to the Rhine.

1811.

3. Describe the operations between the 5th and 9th March, by which Massena withdrew his forces from Santarem, and concentrated in front of Pombal (with sketch).

4. Make a sketch of Massena's position at Condeixa. With what object did he make a stand at this point? and how were his designs frustrated and his army shouldered off the Mondego by Wellington's combinations?

America, 1862–3.

5. With what object was the expedition up the Cumberland and Tennessee rivers organized? Give a brief description of Grant's advance to Fort Donnelson, and the strategical results of his success.

6. Describe Grant's passage of the Mississippi and investment of Vicksburg (April and May 1863); and explain the great importance which attached to this place from its position in the theatre of war and the various advantages derived by the Federals from its fall.

Senior Division.

Military Administration.—Captain Martin Petrie, 14th Regiment.

1. What military departments are charged with the administration of the army? Give an outline of the duties and responsibilities which devolve upon each of these when a force is in the field.

2. If a corps d'armée 25,000 strong were formed with the intention that it should operate as a defensive force against an enemy expected to land on the coast of Sussex, what would be a judicious proportion to maintain between the several arms (engineers included)?

3. What are the relative advantages and disadvantages of attaching a proportion of Cavalry to the several divisions of an army, or retaining the whole as a separate body?

4. What alterations in the organization and formation of Infantry have been caused by the progressive improvements in fire-arms? If breech-loaders come into general use, what further changes will their introduction have a tendency to produce?

5. How are the several reserves of small-arm ammunition distributed and carried in the field? If an officer commanding a battalion is in want of a fresh supply, through whom is the application to be made? Should his regiment be actually engaged, what steps may he take to obtain it?

6. What measures were adopted to reduce the weight carried by the French Infantry in the Italian campaign of 1859? What head-dress did they fight in at the Battle of Solferino?

7. What special privileges are enjoyed by the French Imperial Guards as to the manner in which they are commanded? and what advantage to the operations of an army is intended to be secured thereby?

8. If a regiment is ordered to embark for foreign service, what arrangements should the officer commanding make respecting ammunition?

9. How are the arms to be disposed of during the voyage? and what precautions are to be taken to prevent any injury to them?

10. To what extent does the present position of commissariat officers give them military command?

11. When an army is occupying a foreign country, what considerations should guide the Commissariat Department as to the system of obtaining supplies? What drawbacks are there to employing native contractors when active operations are expected?

12. What proportion of Military Train was sent to China in 1860? By what arrangements was the establishment expanded after arriving? From whence was a supply of horses and mules obtained?

13. If a division, consisting of three brigades of Infantry, one regiment of Cavalry, and two batteries of Artillery, is to move by a single line of road, what would be the nature of the orders issued to the several brigades and corps? and in what sequence would it be advisable to place them, supposing the march takes place beyond the reach of an enemy?

14. If a large train or convoy, consisting of 500 or 600 waggons, has to be moved upon a single line of communication, what will be the best arrangement to make in order to secure periodical halts for men and horses and at the same time to keep the whole as much together as possible?

15. In laying out a site for an encampment, what considerations would guide you in assigning the places to be occupied by the Cavalry and Artillery? Upon what points would the Sanitary Officer give his advice and assistance to the Quarter-Master-General's Department?

Senior Division.

Military Legislation.—Captain Martin Petrie, 14th Regiment.

1. What is the effect of declaring a town or district under martial law? What is the equivalent term generally used on the continent?

2. To what extent are the yeomanry and volunteer forces subject to the Mutiny Act and Articles of War at present? Could events or circumstances arise which might lead to their being completely so?

3. If a soldier declares himself to be a deserter from another regiment, and there are no means within reach by which the validity of his statement can be tested, what course may the commanding officer adopt?

4. Under what circumstances should you consider that an officer in command would be justified in selecting officers to compose a district or regimental court-martial without reference to the roster? Would an objection raised by the prisoner as to the composition of the court in such a case be tenable?

5. Would an officer be justified in placing one senior in rank or standing to himself in arrest in any case short of the occurrence of an actual "fray"? If so, state the principles which you consider should guide an officer upon such a question.

6. If a regiment or detachment is embarked on board a troop ship commanded by a naval officer, to what extent can the senior military officer carry out the usual discipline of the service, in awarding minor punishments, assembling courts-martial, &c.

7. Under what circumstances may a soldier be brought to a court-martial for stealing the property of a civilian in the United Kingdom?

8. Who is responsible that the proceedings of a general, a district, and a regimental court-martial respectively, are correctly recorded.

9. Can any addition or alteration be made in the charges preferred against a soldier after he has been warned for trial and the charges read to him, or a copy of them furnished to him?

10. State the distinction between mutiny and mutinous conduct.

11. State what objections (if any) exist to the following charge:—

"For having disobeyed the lawful command of Major C., his superior officer, when on parade at Agra, on the 10th July 1864, and for making use of disrespectful language when ordered into arrest shortly afterwards."

App. VIII.
Staff College.

12. If a prisoner is brought before a court-martial, and he appears, as the trial proceeds, to be of unsound mind, what would be the proper course for the court to adopt?

13. Frame charges upon the following evidence:—

Serjeant A.B. states:—"The prisoner, Corporal C.D., had a pass until "12 o'clock on the night of the 12th May last. About 8 o'clock the same "evening I met him in the town of Liverpool. He was disguised in plain "clothes. As soon as he saw me he ran away, but I followed him, and "after going a short distance, met Privates E. F. and G. H., whom I ordered "to secure him and bring him to barracks. On searching him in the Guard "Room, the watch and the paper now produced were found upon him." (The said paper purports to be a passage-ticket to America.)

Serjeant-major R.S. states:—"I recognize the watch as my property. I had "mentioned in the hearing of the prisoner, on the morning of the 12th of May, "that it was out of order; and upon his saying that he knew a tradesman in "the town who could repair it well, and offering to get it done, I let him have "it for that purpose. There was a gold chain attached to it, which is now "missing."

If the facts are proved, to what punishments is Corporal C.D. liable? Which are obligatory, and which at the discretion of the court?

14. If a regiment is under its establishment, and recruits are required, what steps should the officer commanding take?

15. What limitations does the Enlistment Act specify as to the period at which a man may renew his first engagement; and how may his service be further prolonged on the close of his second term of service, either by himself or by the officer commanding?

French.—M. Esquiros.

I.

Traduisez en Anglais:—

L'ensemble du champ de bataille présentait un triangle allongé, dont le sommet était à Charleroy, et dont les deux côtés venaient tomber sur la grande chaussée de Namur à Bruxelles, l'un aux Quatre-Bras, l'autre à Sombreffe. Napoléon et Ney, en faisant face le premier aux Prussiens, le second aux Anglais, étaient rangés chacun sur un côté du triangle et étaient pour ainsi dire adossés l'un à l'autre, à la distance de trois lieues environ. Il était donc facile à Ney, qui ne pouvait pas encore avoir beaucoup de monde à combattre, de détacher 12 à 15 mille hommes sur les 45 mille dont il disposait, lesquels faisant volte-face devaient prendre à revers la position de Ligny et de Saint-Amand, et envelopper la plus grande partie de l'armée prussienne. Si cette manœuvre était exécutée à temps, Marengo, Austerlitz, Friedland, n'auraient pas procuré de plus vastes résultats que la bataille qui se préparait, et certes nous avions grand besoin qu'il en fut ainsi!—Thiers.

II.

Questions grammaticales.

1. Ecrivez les temps primitifs de *se taire, se repentir, s'en aller, s'asseoir, se tuer;* le présent du subjonctif de *vouloir* et l'imparfait du subjonctif de *naître.*

2. Comment diriez-vous en français? I *rose very early this morning.* I *rose* at five o'clock yesterday. I *rose* very late when I lived in the country. Indiquez en peu de mots les raisons qui motivent ici un changement de temps.

3. Quelle différence faites-vous entre *plus tôt* et *plutôt, venir de* et *venir à, user* quelque chose et *user de* quelque chose?

4. Pourquoi dites-vous en français:—Elle s'est *évanouie* et elle s'est cassé la jambe? D'où vient que le participe passé est au féminin dans le premier cas et ne l'est pas dans le second?

5. Traduisez en français:—Why prepare new victims to be involved in, and

overwhelmed by, my cruel fortune? Indiquez en même temps pourquoi la construction de la phrase anglaise serait vicieuse dans l'autre langue.

6. Est-il correct d'écrire, ainsi qu'on le fait si souvent dans les journaux anglais :—" Le *morale* de l'armée est excellent " ?

7. De quelle préposition doit-on se servir dans la phrase suivante devant un nom de royaume, de province, de ville, et de personne? I go to France, to Normandy, to Caen, to my uncle's.

III.

Décrivez, sous la forme d'un rapport adressé à un général, la marche d'un corps d'armée dans un pays de montagnes. Vous supposerez l'ennemi embusqué à quelque distance, caché par les plis du terrain ou par des bois et prêt à attaquer au moment favorable.

IV.

Traduisez en français :—

Head Quarters, Te Awamuta, Feb. 5.

A force, under command of Lieut.-General Cameron, made a flank march on the night of the 20th of February, by which the whole of the native strongholds, constructed with immense labour to oppose his advance, were successfully turned. They were immediately evacuated by the natives, who fell back on a strong position in front of Rangiawahia, their principal source of supply.

On the 22d General Cameron attacked this position, which was most gallantly assaulted and carried by the 50th Regiment.

We are now in possession of the rich country between the Waipa and Waikato rivers, as far as Rangiawahia, from which the natives have retired.

There were three officers severely wounded, viz., Lieut.-Colonel Nixon, Colonial Defence Force, Lieutenant Payan, 65th Regiment, and Ensign Doveton, 50th Regiment; and four men killed and twenty-four wounded.

German.—Rev. C. Schöll, Ph. D.

Translate into English :—

Jetzt erst, nachdem die Wuth des Kampfes erkaltet ist, empfindet man die ganze Größe des erlittenen Verlustes, und das Jubelgeschrei der Ueberwinder erstirbt in einer stummen finstern Verzweiflung. Er, der sie in den Streit herausgeführt hatte, ist nicht mit zurückgekehrt. Draußen liegt er in seiner gewonnenen Schlacht, mit dem gemeinen Haufen niedriger Todten verwechselt. Nach langem vergeblichen Suchen entdeckt man endlich den königlichen Leichnam, unfern dem großen Steine, der schon hundert Jahre vorher zwischen dem Floßgraben und Lützen gesehen worden, aber von dem merkwürdigen Unglücksfalle dieses Tages den Namen des Schwedensteines führt. Von Blut und Wunden bis zum Unkenntlichen entstellt, von den Hufen der Pferde zertreten, und durch räuberische Hände seines Schmuckes, seiner Kleider beraubt, wird er unter einem Hügel von Todten hervorgezogen, nach Weißenfels gebracht, und dort dem Wehklagen seiner Truppen, den letzten Umarmungen seiner Gemahlin überliefert. Den ersten Tribut hatte die Rache geheischt, und Blut mußte dem Monarchen zum Sühnopfer strömen; jetzt tritt die Liebe in ihre Rechte ein und milde Thränen fließen um den Menschen.

Translate into German :—

At last the tidings arrived of the utter destruction of both the consular armies (at Cannæ), and of a slaughter such as Rome had never before known. Even Livy felt himself unable adequately to paint the grief and consternation of that day; and the experience of the bloodiest and most embittered warfare of modern times would not help us to conceive it worthily. But one simple fact speaks eloquently: the whole number of Roman citizens able to bear arms had amounted at the last census to 270,000; and supposing, as we fairly may, that the loss of the Romans in the late battles had been equal to that of their allies, there must have been killed or taken, within the last 18 months, no fewer

App. VIII. Staff College.

than 60,000. It must have been true, without exaggeration, that every house in Rome was in mourning.

Those who are able, may write, in German, an essay on Patience.

Grammatical Questions.

1. Give the first person of the imperfect indicative and the past participle of liegen liegen, lügen, brauchen, brechen, laufen.

2. Conjugate the imperfect subjunctive of the passive voice of treiben.

3. State the cases governed respectively by the prepositions wegen. nach, längs, in, aus.

4. State the rule respecting the gender of nouns ending in =thum, =lein, =heit,=niß,=ſchaft.

HINDUSTANI.—Rev. W. D. MACLAGAN, M.A.

I. *Grammar.*

1. Explain the formation of the principal tenses and participles of the verb when the root ends in a consonant and in a vowel respectively.

2. Give the past participle, masculine and feminine, of *denā, jānā, karnā lānā, marnā, sānā, sunnā, nikalnā.*

3. How are the verbs *jānā* and *karnā* used in composition? and with what meanings?

4. What are the respectful tenses? Mention some common exceptional formations.

5. Which of the pronouns are sometimes used as substitutes for an indefinite article?

Translate:—He said that he had never struck the woman at all. You must have heard the news. It is not credible. Throw away that stone; it is useless. He went to fetch the horse. What can have happened?

II. *Translation.*

Translate:

A.

شاهجہان بادشاہ کي شہزادہ دارا شکوہ کو چڑیاؤں سي بہت
شوق تھا ایک روز فرمایا شہر مین منادي پھیر دو کہ جس کي یہان
جو جانور شکاري اڑني لڑني بولني والا ہي لیکر کل فجر حضور مین
حاضر ہووي اس خوش خبري کی سنني ہي جتني شہر مین
شوقین تھی اپني اپني پرندون کو اڑاي لڑاي بلاي تیار کر بڑي
تکلف سي لي گئي اور کوئي تماش بین تماشا دیکھني کی لالچ سي
ایک کوي کو پنجري مین بند کرکي ایک عمدہ غلاف اسپر ڈال انکي
پیچھی لیي چلا گیا ۞

B.

جب شب تمام هُوئی اَور پرچها هونے لگا تب ایک پوکهر کي کناري
پہُنچي اُتر کر مُنہ هاتھ دهوئي جلدي جلدي کُچھ ناشتا کرکي
پهِر سوَار هو کر چلي کبهُو مِلک کُچھ کُچھ باتيں کرتي اَور يُون
کہتي کہ هم نے تيري خاطِر شرم حَيا مُلک مال ما باپ سب چهوڑا ايسا
نے هوکے تُو بهي اُس ظالِم بيوفا کِي طرح سُلُوک کري کدهُو مَين
کُچھ احوال اِدهر اُدهر کا راه کهني کي لِئي کہتا اَور اُس کا بهي جَواب
ديتا کے پادشاهزادي سب آدمي ايک سي نہيں هوتي ۞

C.

بهادون مين بِجْلي اکْثر کڑکْتي چمکْتي هَي اَور مينہ دڑيڑي
سي برسْتا هَي پر بيشْتر جلْد کهُل جاتا هَی اَور اسْکي آخِر مين
يُون بهي هوتا هَي کہ ايک طرف مينہ ايک طرف دهُوپ بلْکہ
مُبالغہ يہان تلک کرْتي هَين کہ بهادون کا مينہ اچنْبهي کا هَي
کہ بَيل کا ايک سِينگ گِيلا اَور ايک سُوکهي کا سُوکها رَها ۞

III. *Composition.*

Translate into Hindustani:—

a. Walking one day in one of the rooms of his palace, the king perceived a serpent, which put its head out of a hole in the wall. Upon this he immediately ordered the place to be searched, and the serpent killed. On opening the wall, hower, they could not discover the serpent, but they found a secret place in which a large amount of money and jewels was concealed. The palace had formerly been in the possession of the king's enemy, who, when forced to fly, had thus secreted his property. Thus the king, who had been raised to the throne, attained also to great wealth; for before this time he had been in poverty, being only a fisherman's son.

b. What is the prisoner's name? What was the charge against him? That upon the night of the 19th instant, the prisoner, along with two other Sepoys, of whom only one is known, assaulted the complainant as he was walking across the common, and robbed him of a box which he was carrying, which contained both money and letters belonging to the Government. Was there sufficient evidence to substantiate the charge? Yes, the Court found it fully proved. What was the sentence? That he should be imprisoned with hard labour for two months.

Write in Hindustani a short description of an army crossing a river in the vicinity of the enemy.

App. VIII.
Staff College.

MINERALOGY AND GEOLOGY.—WARINGTON SMYTH, M.A., F.R.S.

1. State what relation is found to obtain between the cleavage of minerals and the form of their crystals.

2. Describe some principle for dividing the various forms of crystals into definite groups, and a mode of conveniently describing them by symbols or formulæ.

3. Enumerate the respective peculiarities of the species of felspar called Labradorite, Adularia, Oligoclase, and Rhyacolite.

4. Give an account of what is meant by *isomorphism*, and an example of a group of isomorphous bases.

5. What are the external characters and the composition of the ores suitable for the smelting of iron, and of minerals sometimes occurring with them, which may injure the character of the metal?

6. State the appearance, composition, and localities of the varieties of calcite, or carbonate of lime, which are applicable for employment in hydraulic works.

7. Mention the per-centage of the several metals contained in and the general characters of the ores called Calamine, Malachite, Galena, and Copper Pyrites.

8. State the composition of the various useful salts found to effloresce from the surface of alluvial lands in sundry hot countries.

9. Describe the minerals, physically and chemically, which most frequently enter into the composition of volcanic rocks.

10. Give some account of true volcanic action, and of what are termed pseudo-volcanic phenomena.

11. Draw up a table of all the stratified rocks which occur below the Devonian series, stating the thickness of each, and where it has been observed.

12. Specify some of the fossil remains by which the older stratified rocks, Silurian and Cambrian, may be identified.

13. Mention some facts which prove the great amount of *denudation* which has taken place in certain formations.

14. What are the circumstances, beyond the mere substances of composition, which should be examined into, in selecting stone for building purposes?

15. Detail the facts which bear upon the doctrine of internal heat beneath the surface of the earth.

16. State the leading views on the origin of springs, and what may guide to the most probable mode of finding them.

17. Construct a transverse section of any one of our British coal-fields, showing the approximate thickness of the various groups of strata.

18. State the argument for the proof of contemporaneity of strata by fossil remains; and show why the *Testacea* are the fossils chiefly appealed to.

SENIOR DIVISION.

EXPERIMENTAL SCIENCE.—Professor LIVEING, M.A.

1. How much air by weight is required for the complete combustion of 1 lb. of charcoal? What ratio will the bulk of the resulting gases, when cooled, bear to that of the air employed?

2. Describe the preparation of chlorate of potash; and explain the chemistry of the process. State some of the useful applications of this substance, and the chemical action involved in them.

3. State the composition of the several acids derived from sulphur. Explain the chemistry involved in the following sentence:—"Sulphate of iron derived from iron pyrites is deprived by heat of the greater part of its water of crystallization and subjected to a high red heat in earthen retorts."

4. A mixture of chlorides of calcium and potassium being given for analysis, explain the process by which you would demonstrate the presence of the several ingredients, and the absence of other things.

5. What is the chemical constitution of the substances known as hydraulic limes? If you had pure limestone and required an hydraulic mortar, what process would you employ? and what chemical action would you expect to take place?

6. Explain what is meant when it is said that the latent heat of steam is 535. Hydrogen in burning gives off heat enough to raise about 31,000 times its weight of water 1° C., and the specific heat of steam is ·495; what is the temperature of a hydrogen flame burning in oxygen?

7. What is meant by the *colour* of heat? An air-thermometer (consisting of a bulb of glass connected with a narrow tube in which is a liquid index) when held in the sunshine which enters a room through a window shows the same temperature as it does in the shade so long as it is at a distance from other objects, but if placed on a table in the sunshine it shows a rise: explain this.

8. Define the *dew-point*; and explain how to determine it.

9. Describe how to charge a Leyden jar by means of an electrophorus; and explain the action.

10. Describe the construction and action of Daniell's battery.

11. The current of a battery in which the plates are 6 inches square is sent through a wire 30 inches long and $\frac{1}{5000}$th of a square inch in section, and which has a conducting power 300,000 times that of the acid in the battery: will the wire be more heated when the copper plate of one cell is connected with the zinc of the next, or when all the copper plates are connected together by themselves and all the zinc plates likewise?

12. Describe the action of a magneto-electric machine; stating the general laws involved.

PRACTICAL ASTRONOMY.—Rev. JOHN F. TWISDEN, M.A.

1. Show that the angles at the base of an isosceles spherical triangle are equal.

If BC is the base of an isosceles spherical triangle, and p is the arc of a great circle drawn through A at right angles to BC, show that

$$\cos c = \cos \frac{a}{2} \cos p.$$

2. State and prove the rule for determining the area of a spherical triangle in terms of its angles.

On the surface of the earth (supposed spherical) two triangles of equal area are drawn; the former triangle is contained between two meridians and the equator, the angles of the latter are 84° 32′, 95° 17′, 58° 24′ respectively. Determine the angle between two meridians in the former triangle.

3. State what is meant by Apparent, Mean, and Sidereal time. Define the equation of time, and explain to what causes it is due. When an astronomical clock is free from error, what does it show? What phenomenon in the sidereal day corresponds to apparent noon in the apparent day?

On 1864, April 10th, at a place 40° E. of Greenwich, the astronomical clock shows $7^h\ 15^m\ 32^s$; determine at that instant the sidereal time and mean time at Greenwich, and the mean time at the place.

4. Explain the process of determining the declination of the compass by observing an altitude of a heavenly body.

5. The double altitude of the lower limb of the sun, corrected for instrumental error, was found to be 45° 18′ 20″ when on the meridian of an observer on 1864, December 18th; his longitude is about 90° W. Find his latitude. (Refraction 128″.)

6. Explain the process of determining the latitude of a station by observing an altitude of the pole-star when out of the meridian.

On 1864, April 15th, at a sidereal time $10^h\ 15^m\ 34^s$, the altitude of the pole-star was found after correction to be 49° 18′ 23″; determine the latitude of the station.

7. What is meant by the "Error of Deviation" of a transit instrument? Explain the method of determining it by means of the transit of two known stars.

On 1864, September 8th, the star α Lyræ crossed the mean wire of the transit instrument when the clock showed $16^h\ 16^m\ 17^s{\cdot}3$; on the same evening the star α^2 Capricorni passed the mean wire when the clock showed $17^h\ 54^m\ 22^s{\cdot}5$; determine the error of deviation, all other errors having been corrected.

8. Explain briefly how it can be ascertained when a transit instrument moves in the plane of the prime vertical. Explain the method of determining the

App. VIII. Staff College.

latitude of a station by observing the transit of a heavenly body across the plane of the prime vertical.

9. Explain the method of reducing a measured angle to the centre of a fixed station.

No. 1. Mathematics.—Advanced Course.—Rev. John F. Twisden, M.A.

1. Explain what is meant by (*a*) by the coordinates of a point; (*b*) by the origin of coordinates; (*c*) by coordinate axes; (*d*) by the equation to a line.

What is the meaning of the following equations?

$$x^2+y^2=0, \quad xy=0, \quad f(x)=0, \quad f\left(\frac{x}{y}\right)=0.$$

2. Determine the equation to a straight line in terms of its perpendicular distance from the origin, and the angle between that perpendicular and the axis of x.

If $Ax+By+C=0$ and $ax+by+c=0$ are lines equally distant from the origin, show that

$$\frac{a^2+b^2}{A^2+B^2}=\frac{c^2}{C^2}.$$

3. Determine the equation to the tangent at any point of a circle whose centre is the origin.

4. From P any point of a given circle a pair of tangents is drawn to a second given circle whose centre is O. The line joining the points of contact cuts OP in Q. Show that the locus of Q is a circle.

5. Given the equation to a curve referred to rectangular axes; explain the method of transforming it to any other rectangular axes.

6. Define the ellipse. From the definition obtain its equation referred to its major and minor axes.

Transform the equation to any rectangular axes passing through the centre.

7. Given a straight line and an ellipse. Take a point P within or without the curve. Through P draw a straight line cutting the ellipse O and O_1, parallel to the given line. Determine the rectangle under OP, PO_1. If the rectangle is constant, determine the locus of P.

8. Given the equation to a hyperbola; determine the equation to its asymptotes.

9. Determine the nature and position of the curve whose equation is

$$9x^2+24xy+16y^2-2x+14y+81=0.$$

No. 2. Mathematics.—Advanced Course.—Rev. John F. Twisden, M.A.

2. State what is meant by a "Limit." Give a geometrical example of a variable magnitude whose limit is finite. Give a geometrical example in which the limits of two quantities are severally zero, and the limit of their ratio finite. Define the differential coefficient of a function of one variable.

2. Determine the differential coefficient of u with respect to x in the following cases:—

(*a*) $u=f(x)\times F(x)$. (*b*) $u=f(v)$, where $x=F(x)$.

(*b*) $u=\sin^{-1}(\log x)$. (*d*) $u=\tan^{-1}(\cos\sqrt{1-x^2})$.

3. Prove Maclaurin's Theorem, and by means of it expand $(a+x)^m$ in ascending powers of x. In the particular case where $m=-\frac{p}{q}$, show that the general term of the expansion is

$$\frac{1}{(-q)^n}\cdot\frac{p(p+q)(p+2q)\ldots(p+\overline{n-1}.q)}{1.2.3\ldots\ldots n}\cdot\frac{x^n}{a^{\frac{p}{q}+n}}.$$

4. State what is meant by the partial differential coefficients of a function of two or more variables.

If $f(xy)=0$, show that $f'(x)+f'(y)\frac{dy}{dx}=0$.

Determine $\frac{dy}{dx}$ from the following equation,

$$m \log \left(\frac{x}{y}\right) + \left(\frac{y}{x}\right)^n = k.$$

5. What is meant by the maxima and minima values of a function of x? Determine them in the following case, distinguishing the maxima from the minima values,

$$u = 5x^5 - 10x^3 + 8x.$$

6. Determine the equation to the tangent at any point of a given curve.
Find that of the curve whose equation is

$$ay^n = (a+x)^{n+r}.$$

7. Trace the curve whose equation is

$$y^2(x+a) = x^3 - a^3.$$

No. 3. Mathematics—Advanced Course.—Rev. John F. Twisden, M.A.

1. State what is the object of the process of integration. Integrate the following expressions:—

(*a*) $\int \frac{dx}{5+4x-x^2}$.

(*b*) $\int dx.(3a+x)\sqrt{b+6ax+x^2}$.

(*c*) $\int dx \frac{x^{10}}{x-a}$.

(*d*) $\int dx \,.\sec^2 x \,.\log(\tan x)$.

2. What is meant by a formula of successive reduction? Obtain such a formula in the following case:

$$\int dx \,.\, x^m \sqrt{a^2+x^2}.$$

3. State and prove the rule for finding the area of a curve. Determine the form of the curve whose equation is

$$a^5 y = x^3 \sqrt{a^4 - x^4};$$

and find its area between the limits $x=0$ and $x=a$.

4. Define the moment of inertia of a body with reference to a given axis.
Given the moment of inertia of a body with reference to a given axis passing through the centre of gravity; determine it with respect to a parallel axis.
Determine the moment of inertia of a spherical surface with respect to any exterior axis.

5. Determine the radius of curvature at any point of an ellipse; and the approximate formula when the ellipticity is small.
Explain how the ellipticity of the earth is actually determined.

6. Show that the function $\frac{1}{c\sqrt{\pi}} \cdot \epsilon^{-\frac{x^2}{c^2}} \delta x$, which expresses the law of the probability of errors, fulfils the conditions which might be expected *à priori* of such a function.

7. What is meant by the "probable error" of a series of measures of a quantity determined by direct observation?
If e is the probable error of $m_1, m_2 m_3, \ldots n$, independent measures of the same magnitude, show that the probable error of the mean of the measures is

$$\frac{e}{\sqrt{n}}.$$

8. State briefly the method of observing the bearings of a number of stations taken from a given station; and sketch the method actually adopted of ascertaining from the observations the most probable value of the bearings.

Mathematics.—Rev. Canon Heaviside, M.A.

For Officers not taking up Mathematics as a subject.

1. Show how the area of a triangle may be represented numerically. Explain the assumptions that are made in thus expressing geometrical quantities

App. VIII. Staff College.

by numbers. The three sides of a triangle are 15, 12, 9 feet respectively; show numerically that if an equilateral triangle be described on each of the three sides of the triangle, the area of the triangle on the greater side is equal to the sum of the areas of the triangles on the other two sides.

2. Find the area of a regular pentagon inscribed in a circle, the radius of which is 10 feet.

3. Find the content of a right cylinder with a circular base, the height of the cylinder being two yards, and the diameter of the base 4 feet; find the number of gallons of water the cylinder would contain, it being given that a gallon is 277·274 cubic inches.

4. The three conterminous sides of a cube are bisected, and the corner of the cube is cut off by a plane passing through these points of bisection; find the ratio of the pyramid cut off, to the whole volume of the cube.

5. An observer measures a base AB (300 feet) on one bank of a river, C is an object on the opposite bank, and he observes the angles

$$BAC=45^\circ\ 50'\ 15'',\ ABC=60^\circ\ 0'\ 45'':$$

find the breadth of the river.

6. A balloon ascends vertically; an observer standing at a distance of 800 yards from the point where the balloon left the horizontal plane observes its angle of elevation to be 75° 20′: find its height at the time of the observation.

7. If the angle of elevation of a tower to an observer standing at the distance of 500 feet from it be 35° 17′, what will be the angle of elevation when the observer stands at a distance of 1,000 feet from the tower?

8. Explain the effect of buttresses in supporting a wall that is subject to an oblique lateral pressure. A wall is two feet thick and 25 feet high; a pressure of 520 pounds acts on the interior of its summit, the direction of the pressure making an angle of 60° with the horizon: determine the weight of the wall so that it shall just not be overthrown.

9. An embankment of brickwork which has the form of a right-angled triangle ABC is exposed to the pressure of water, A is the highest point, AB vertical is 14 feet, BC horizontal 6 feet; find the horizontal pressure applied at A that would keep the embankment steady, if the water rises to the top, A.

10. A pontoon is a cylinder with its ends hemispherical; the length of the cylindrical part of the pontoon is 19 feet 4 inches, and its diameter 2 feet 8 inches. Supposing the weight of the pontoon with its superstructure to be 1,550 pounds, what additional weight will be required just to force it under water?

Italian.—Professor C. De Tivoli.

Translate into English:

Innanzi di cominciare la pugna volse lo Sguardo attorno all' Europa a fine di misurare la propria possanza e in un tempo quella dell' inimico. In Francia regnava Filippo I., giovine d'anni, valoroso inarmi, audace nelle voglie, fermo nel satisfarle; era circondato da potentissimi baroni i quali, comecchè spesso in lotta fra loro, erano validi sostegni del trono, non meno di quel che lo fosse il clero, che per essere feudale anch' esso più che altrove, mostravasi più obbediente al proprio sovrano che alla corte romana. La penisola Spagnuola era partita fra i principi Saraceni e i Cristiani, che non cessando mai d' osteggiarsi vicende-volmente, erano concordi ad avversare il dominio che il papa voleva esercitare negli stati loro. Tra Roma e i principi normanni, nuovi conquistatori dell' Inghilterra, era concordia apparente, grazie alla postura di quel nuovo reame, non che all' indole ferma ed eroica di Guglielmo il conquistatore.—Giudici, *Storia dei Comuni Italiani.*

Grammatical Questions.

1. Write the irregularities of the verbs *crescere, giacere, morire.*

2. To what object is the definite article sometimes placed before the infinitive of verbs?

3. Demonstrate the different uses of the pronouns *chi, che, quale:* write some examples.

4. Give the Italian idiomatic expressions for the following sentences:—
"It is never too late to mend."
"He was taken in by a false friend."
"He is a sensible man."

5. Render the true meaning of—"Alla larga"—"A lungo andare"—"Andar bel bello"—"Cavarsela alla meglio."

Write in Italian an account of the siege of any fortress of which you may have read.

Translate into Italian:

In this manner Cato died, who was one of the most faultless characters we find in the Roman history. He was severe, but not cruel; he was ready to pardon much greater faults in others than he could forgive in himself. His haughtiness and austerity seemed rather the effect of principle than natural constitution, for no man was more humane to his dependents, or better loved by those about him. The constancy of his opposition to Cæsar proceeded from a thorough conviction of the injustice of his aims; and the last act of his life was but conformable to the tenets of his sect, as the Stoics maintained that life was a gift which all men might return to the donor when the present was no longer pleasing.—Goldsmith, *History of Rome.*

Appendix IX.

Regimental Order issued to the Royal Artillery respecting the Advanced Class of Officers of that Corps.

492.

General Regimental Order.

Horse Guards, S.W.
2nd November, 1863.

His Royal Highness the Field Marshal Commanding in Chief has the satisfaction of announcing to the Royal Artillery, that the Secretary of State for War has been pleased to make provision for the future special instruction of Officers who may desire to qualify themselves for employment in connexion with the Manufacturing Departments, the Civil Establishment of the Royal Military Academy, and generally for all appointments usually held by Officers, not being Military Staff appointments, which are special to the Artillery Service.

2. It is the earnest hope of His Royal Highness, that by this arrangement the Royal Regiment of Artillery will continue to sustain its scientific reputation under any progress which may be made in the Mechanical Arts as applied to *matériel* of war.

3. The Deputy Adjutant-General is charged by the Field Marshal Commanding in Chief, to exercise the utmost vigilance that no Officer be permitted to compete for a place in the proposed class who has not given unqualified satisfaction in the discharge of his purely regimental duties, and is not, from a military point of view, an active and efficient Artillery Officer.

4. Officers desirous of competing at the first examination will make application through their Commanding Officr, who in forwarding it will append a certificate in accordance with par. 3.

No Officer will be admissible under six years' service, and he must have undergone a course of instruction at Shoeburyness. A medical certificate of good health will be required.

5. The first examination will take place in March 1864, under the Council of Military Education.

The books to be specially taken up, until further notice, are *Twisden's Mechanics* and *Todhunter's Differential Calculus*, but the examination will be chiefly confined to the earlier portions of the latter.

The French will be qualifying, for the purpose of ascertaining that the candidate has such an acquaintance with the language, and especially with the technical terms in common use, to be able to consult professional works, such as Didion's *Traité d'Artillerie*, or the *Aide-Mémoire d'Artillerie*, with facility.

6. The relative importance to be attached to the subjects of examination will be as follows:—

	Marks.
Differential and Integral Calculus } Practical Mechanics - - } - - -	700
Chemistry - - } Physics - - } - - -	300
French—Qualifying,	

7. The course of instruction will extend over two years, and embrace in succession the special duties of each manufacturing department. For example, in the Royal Gun Factories:—

Metallurgy of copper, tin, zinc, and their compounds; mechanical and chemical properties of gun metal.
Metallurgy of iron, including cast-iron and wrought-iron, steel, and alloys; mechanical and chemical properties.
Principles of construction of cast guns.
Principles of construction of built-up guns, welding, &c.
The steam hammer.
Turning, boring, rifling, and sighting guns. All the machines, lathes, special tools, and processes.
Comparison of systems of rifling, and breech-loading for cannon.
Gauges and micrometrical measurements.
Organization of labour in the Royal Gun Factories.
System of account keeping, pricing, and payment in the Royal Gun Factories.
Relation to the Director of Stores, Director of Contracts, Principa Superintendent of Stores, and Director of Ordnance.
Patterns, system respecting them. Examination of Stores.

8. Duties of the Inspector of Artillery,—

Proof of guns.
Examination of guns and stores.

9. The Small Arms Departments, Enfield and Pimlico, will follow the Royal Gun Factories, and be treated in the same comprehensive manner, including the system of supply of small arms to the army; their repair, and comparison of systems of rifling and breech-loading for small arms.

10. From the Royal Gun Factories the class will proceed to the Royal Carriage Department, where the subjects will be:—

Selection and purchase of timber.
Seasoning of timber.
Sawmills.
Planing and other machinery applied to working of timber.
Construction.
Mechanical principles as applied in military machines.
Friction, draught, traction, locomotive power.
Harness.
Organization of labour in the Royal Carriage Department.
System of accountability and payment. Prices.
Relations to Directors of Stores, Director of Contracts, Principal Superintendent of Stores, and Director of Ordnance.
Patterns, system respecting them. Examination of Stores.

11. Here will conveniently come in the organization and duties of the Department of the Principal Superintendent of Stores, including the detail of Equipments for all services; and proportions of stores, packing ammunition, arrangement of magazines,

12. The last Term will be devoted to the manufacture of gunpowder, ammunition, and generally the duties of the Royal Laboratory, including the chemistry of the subjects.

Selection and purchase of pyrotechnic material.
Examination and refining of saltpetre, &c.
Gunpowder, and powder-mills.
Theory of gunpowder, qualities, effect of different sized grains.
Electro-ballistic apparatus, and other modes of proof.
Gun cotton.
Detonating compounds.

Other laboratory preparations.
Small arm ammunition, cannon ammunition, fuzes, rockets, &c.
Manufacture of bullets.
Casting of every description of projectile for smooth bored and rifled ordnance.
Organization of the Royal Laboratory Department.
Supply of raw material.
System of account keeping and payment. Prices.
Relations to the Director of Stores, Director of Contracts, Principal Superintendent of Stores, and Director of Ordnance.
Patterns, Inspection. Examination of stores.

13. The Professor of Applied Mathematics, and the several Lecturers, will proceed in corresponding order through their subjects; so that practical instruction may be based on thorough acquaintance with principles. If found necessary to do so, a large part of the first term will be devoted to Theoretical Instruction and Mathematics, in order that the students may be in a position to follow the Professor in the more advanced subjects of his subsequent Lectures.

14. There will be periodical examinations, and certificates given at the close.

15. No payment will be required.

16. After a certain date, to be fixed hereafter by His Royal Highness the Field Marshal Commanding in Chief, first appointment to all special employments of a scientific character will be made exclusively from officers who have passed through the contemplated course of instruction.

By Order of
H.R.H. The Duke of Cambridge, K.G.,
Colonel of the Royal Artillery.
Charles Bingham,
Deputy Adjutant-General.

Officers examined for admission to the Advanced Class in May 1864.

Order.	Index Number.	Names.	Station.	Total Marks.	Remarks.
		Maximum - -	- -	1,000	
1	5	Lieut. J. P. N. Nolan -	Home -	888	Qualified for admission.
2	2	Captain C. O. Browne -	„ -	619	
3	4	„ W. H. Wardell -	„ -	539	
4	6	Lieut. F. S. Stoney - -	„ -	534	
5	1	„ F. M. Smith - -	Montreal	519	
6	1	Brevet-Major C. M. Govan -	Home -	479	
7	7	Captain J. B. Richardson -	„ -	461	
8	3	„ F. Close - -	„ -	433	
	2	- - - -	Canada -	383	Not qualified.

Appendix X.

Sketch of a course of Theoretical and Practical Mathematics proposed to be adopted at the Royal Military Academy, it being presumed that the distinctions of Theoretical and Practical Class shall have been abolished, and that the whole body of cadets will form one school (or college) of application consisting of five classes, and corresponding to five terms, sessions, or half years of residence, by the Rev. Canon Moseley, M.A., F.R.S.

By reason of the higher attainments of the cadets in theoretical knowledge when they enter the Academy now than heretofore, it is possible for them to begin to study the application of theory to practice at an earlier time.

In respect to certain elementary forms of such application, that study should indeed be commenced from their first admission to the Academy.

There are, moreover, some branches of theoretical knowledge which the cadets must pursue whilst they reside in the Academy, being those necessary to the higher and more difficult application of theory to practice, which they cannot be expected to have acquired before their admission, or which, having studied them before, they will require afterwards to revise.

It thus appears to be expedient that the theoretical and practical studies of the cadets should go on together from their first admission to the Academy; and I agree in the opinion of Colonel Wilford, that the distinction of a theoretical class in which they pursue theoretical studies at one time of their residence and of a practical class in which they study practical questions at another should be abolished.

Their success in both departments of study will, I think, be promoted by their being pursued together, and the distinctive character of the Royal Military Academy as a school of application will therefore be more fully maintained.

The following proposed course is based on this principle of the union of theoretical and practical instruction from the first.

First Session.

1. Mensuration.
2. Descriptive Geometry.
3. Mechanics { 1. Statics. 2. Work.

Second Session.

1. Co-ordinate Geometry.
2. Differential Calculus.
3. Mechanics { 1. Dynamics. 2. Hydrostatics. 3. Hydrodynamics.

Third Session.

1. Integral Calculus.
2. Spherical Trignometry.
3. Mechanics { 1. Theory of Machines. 2. Stability of walls, piers, and roofs. 3. Pressure of earth and revetments.

Fourth Session.

1. Optics.
2. Mechanics { 1. Strength of materials. 2. Gunnery.

Fifth Session.

1. Practical Astronomy and Geodesy.
2. Mechanics { 1. The steam engine. 2. Arches and suspension bridges.

To render the course of instruction in mechanics efficient for the purposes of a military school, it is necessary that the principles of that science should be illustrated by experiment, and that the expedients of mechanism and the combinations of machinery should be explained by means of models.

With this view a professor should be appointed, acquainted with the theory and the practice of mechanical engineering, and skilful in explaining its details in a popular manner by experiments and models.

The lessons of this professor should be delivered to the third and fourth classes (reckoning from the highest), and therefore in the second and third sessions or terms.

One lecture a week should be delivered to each class. Such lectures would, however, be comparatively useless, unless a strict relation were maintained between them and the respective studies of the classes.

For this purpose it is necessary that the syllabus of the lectures should be prepared beforehand, and furnished to the mathematical masters; and it is also desirable that those masters should attend the lectures delivered to their respective classes.

The lecture should be followed by a "study," in which, under the direction of the master of each class, the subject matter of the lecture should be reproduced in writing by each of the cadets from notes made while the lecture is proceeding.

The lectures thus reproduced by the cadets should be written in books, and subjected finally to the revision of the lecturer; credits being assigned to them by him according to their respective merits, to count at the transfer examinations.

There should be four attendances per week in Mathematics of the three lowest classes (the 3rd, 4th, and 5th); but in the 3rd and fourth classes the above-mentioned "study" should count as one attendance.

These attendances are in addition to that on the above-mentioned Professor of Mechanics.

The theory of Descriptive Geometry is a branch of Mathematics, and should be taught by a Mathematical Master.

Its practical application may be taught in the class of Geometrical Drawing.

All that has been here proposed as a means of adapting the instruction of the Academy to the more advanced knowledge of the cadets, and of bringing it nearer to the standard of the continental military schools, would probably be without avail unless a revision were made of the text books used in their instruction.

These treatises are included in a work of three octavo volumes, entitled "An Elementary Course of Mathematics, prepared for the use of the Royal Military Academy."

The last revision of this course was made in the year 1853, under the authority of the Master General of the Ordnance.

Pure Mathematics are taught in the first two volumes of this treatise; the last is devoted to Mixed Mathematics, and especially to the Sciences of Mechanics and Geodesy, which are the *great* sciences of a military school.

By the more advanced attainments of the cadets in Pure Mathematics on their first entrance to the Academy the teaching of the first two volumes has been in some measure superseded. What knowledge it remains to the cadets to acquire of Pure Mathematics after their admission, may probably be best attained from the text books published from time to time in the Universities, which are kept always in the foremost ranks of progress in this department of scientific knowledge.

It is to the third volume of the Course that my attention has been especially directed, and chiefly to that part of it which treats of the science of Mechanics; I have carefully examined this part of it, and am very sensible of the great mathematical ingenuity and ability exhibited in it; I am nevertheless of an opinion that this book should be revised, with a view of a fuller and more practical discussion of the subjects of which it treats, and their exhibition under more simple and elementary forms; and that this revision should be assigned to the mathematical masters of the Academy, at the discretion of the Governor and the Professor of Mathematics.

As a convenient means of effecting this revision, there should be provided within the walls of the Academy a lithographic press (which an intelligent soldier might soon learn to use); at which press each section of the manuscripts of the revision, as it was completed by the several masters to whom it has been allotted, should be printed, and taken into use in the Academy. In this way it would be put to the test of experience and subjected to criticism, both as to its elementary character (adapting it to be easily understood) and as to its practical bearing, adapting it to some recognized use, and satisfying all the conditions under which it is proposed to be applied.

The lithographic press would thus supply the means of altering and perfecting every section whilst under revision, and the whole of the lithographic manuscripts when united would form a book which might be printed, but which it would be probably better to leave in its manuscript form (as is commonly done in the foreign military schools), so as to admit of the corrections and improvements which the progress of scientific knowledge cannot but suggest continually, and to which the system of an institution like the Royal Military Academy should always be prepared to adapt itself.

App. X.

Royal Military Academy.

In this revision the following works may be consulted :—

General Poncelet.

Introduction à la Mécanique Industrielle. (*Paris, Mathias.*)

Traité de Mécanique Industrielle. (*Liége, Leroux.*)

Cours de Mécaniques, &c. professé à Metz. MSS. Lithographié. (A copy of this MSS. is in the library of the Royal Society).

Mémoire de la Stabilité des Revêtements. (*Paris, Bachelier.*)

General Morin.

Leçons de Mécanique Pratique, 4 vols. 8vo. (*Paris, Mathias.*)

Aide-Mémoir de Mécanique Pratique. (*Ibid.*)

Navier (Membre de l'Institut), Résumé des Leçons données à l'Ecole des Ponts et Chaussées. (*Paris, Goury.*)

Delaunay.

Traité de Mécanique à l'Usage des Aspirants à l'Ecole Polytechnique.

Resal.

Elémens de Mécanique. (*Paris, Ditot.*)

Report on the Polytechnic School by a French Commission in 1851. (This can only be obtained through the Ambassador at Paris. Is is an important document.)

Report on the Polytechnic School by the English Commission in 1857.

Professor Willis.

Principles of Mechanism. (*London, Parker.*)

Professor Mahan.

Elementary Course of Civil and Military Engineeering. (*New York, Wiley and Halstead.*)

Mr. T. Tate.

Principles of Mechanical Philosophy applied to Industrial Mechanics. (*Longman and Co.*)

Examples in Mechanics. (*Ibid.*)

Canon Moseley.

Mechanical Principles of Engineering and Architecture, American Edition, with Notes and Appendix, by Professor Mahan. (*New York, Wiley and Halstead.*)

The revised course should be divided into, first, an *elementary*, and, secondly, an *advanced* course.

The subjects studied in the second or advanced course should (for the most part) be the same as those in the first, but treated (as hereafter explained) in a less elementary way, and requiring a higher standard of previous mathematical instruction.

The second course would thus be (in a great measure) a revision of the first from a higher mathematical point of view.

The first or elementary course of Mechanics should begin with a geometrical proof of the principle of the " Parallelogram of Pressures," from which (also by a geometrical method) that of the " Equality of Moments," should be deduced.

These two principles (with some elementary notions of the centre of gravity as the point on which a heavy body will balance) are sufficient for the solution, by the method of *geometrical construction*, of a very large class of statical problems of practical value and importance.

These may readily be made to include among their conditions that of *friction*, if the resistance of a surface be assumed to be exerted, not (as is customary) in the direction of a normal, but (in the state bordering on motion) as exerted in a direction inclined to the normal at that given angle which is sometimes known as the " Angle of Friction," sometimes as the " Angle of Repose," and sometimes as the Limiting Angle of Resistance.

The method of geometrical construction for the solution of practical problems in Statics has been particularly specified because it is one of very easy and

certain application, and (when a large scale is used) quite accurate enough for all practical purposes; because, moreover, it is (for these reasons) far better adapted to the use of practical men than elaborate trigonometrical calculations and complicated formulæ are ever likely to be.

The conditions of the equilibrium of parallel forces should be deduced from the principle of the equality of moments, with its application to the determination of the centre of gravity (illustrated in a few simple examples of bodies contained by plane surfaces).

This may be considered as completing, for the purposes of the first or elementary course, the *Theory of Statics*.

A large series of practical examples should, however, follow, including the examples of the application of the mechanical powers subject to friction (all of which may be solved by geometrical construction).

The study of the mechanical powers, without considering friction or other prejudicial resistances, should specially be avoided, as tending to encourage a false view of the relations of theory and practice, and an unpractical habit and condition of mind in the student.

The stability of piers, of walls sustained by shores and buttresses, supporting roofs, &c. &c. the stability of walls of reservoirs and revetment walls, and the stability of arches, all admit of being determined (with a full understanding of the principles) by the method of geometrical construction alone, without having recourse to trigonometry, or any form of difficult mathematical calculations; and it is recommended that in the first or elementary course they should all be gone over by that method.

The students would thus be put in possession of those practical resources which they would be able most readily to apply to the solution of professional questions, and this first or elementary course would form the best possible introduction to that more perfect and more exclusively mathematical one which would follow, and which would take them a second time over the same ground, their purely mathematical studies having in the meantime been carried to a higher standard.

At the same time that the cadets enter on this elementary course of statics, they should begin to study the theory of Work.

It is under this form that the science of mechanics offers (probably) the greatest and most valuable resources to practice.

The earliest and some of the most important calculations of the theory of work require nothing more than a knowledge of arithmetic.

The cadets might thus from the beginning be familiarized with questions as to the cost of work yielded by different "motors" (whether living agents or machines), as to the economy which is effected by different ways of applying it, and the loss which is experienced in its transmission from the *motor* point to the working-point in a machine.

Under the head of the theory of work there should be included (under an elementary form) that of the work of steam engines and of hydraulic machines, together with the indicator of Watt, the friction brake of Prony, the dinamometers of Morin and Poncelet.

These instruments should, moreover, be procured for the use of the Academy.

In respect to the elementary course on Dynamics there can be no better book of reference than the Mécanique Industrielle of Poncelet, and especially the volume of that work entitled Introductions, &c.

The subject of "vis viva" may be discussed (under a far more elementary form than in the official treatise) as accumulated work, and may under this more simple form take its place in the elementary course.

The discussion of the subject of Hydrostatics in the official treatise requires no observation; that of Hydraulics is, however, one on which great light has been thrown by recent inquiries, and it requires a careful revision.

The best practical discussion of it will probably be found in the "Leçons de Mécanique Pratique" of General Morin, 2nd part, and the best discussion of the theory of the steam engine (which is intimately connected with it) in the 3rd part of the same work.

(Signed) Henry Moseley.

App. X.
Royal Military Academy.

Extracts from the Regulations of the Royal Military Academy respecting the Course of Studies.

Course of Mathematics.

Arithmetic, Algebra, Logarithms, Geometry, Application of Algebra to Geometry, Trigonometry, Heights and Distances, Analytical and Descriptive Geometry, Conic Sections, Spherical Trigonometry, Mensuration, the Differential and Integral Calculus, Mechanics, Hydrostatics, Dynamics, and Pneumatics. The application of these principles will be shown in the course of lectures on Mechanics, and a more extended application will be carried on in the Practical Class.

Course of Fortification.

Each cadet's work is to be so arranged that it may be bound in two books, viz., a large quarto, to consist of printed papers, manuscripts, and diagrams, and a folio atlas of plates; and these are to be produced at the final Examination. All the constructions used as exercises in practical questions are to be made into finished drawings or neat diagrams, and the explanations or notes on them neatly written in the quarto book.

The only kinds of printing to be used are the ordinary Roman character, Italics, and Egyptian. Every plate is to be signed by the professor or master who receives it, with the date of its reception.

The junior class will go through the following preliminary course of instruction preparatory to the study of Fortification:—

1. Plate of scales.
2. Solids in outline.
3. Do. do.
4. Do. "tinted."
5. Sphere, cone, cylinder.

Those who shall have completed the above course before entering the 4th class, to construct plans and sections of the simplest field works from models, with conventional colouring and shading.

The fifth class will commence with the study of Fortification, and Practical Geometry will be carried on in the following manner:—

6. Solids with plane surfaces, from conditions.
7. Do. do. do.
8. Solids with curved surfaces, shadows to be determined correctly.
9. "Barbette Battery," or other subject on oblique site contoured.

For the third class,—

10. Field Works on irregular site, defiladed.
11. Representation of isometrical projection of revetments, casemates, magazines, &c.
12. Representation of some building by perspective projection.

Elementary Fortification.—This study will commence with an explanation of the use and effect of the various weapons employed in modern warfare.

The elementary principles of defence, illustrated by the rudiments of field fortification.

1. Profiles.—Definitions.—Explanation of the uses and advantages of the different constructions, dimensions, and proportions, followed by practical constructions from proposed conditions.

2. Trace.—Treated of in the same manner as the profiles.

Permanent Fortification.—Two preliminary lithographed plates; one of bastioned polygonal fronts, and the other of profiles. The names of the different parts and the definitions being explained in the printed course book.

Explanation by lectures of the general principles which regulate the construction of bastioned polygonal fronts, followed by practical constructions of profiles and tracing from proposed conditions.

Description of the different modes of communication in fortresses, such as flights of steps, ramps, passages, barriers, &c. illustrated by a plate.

Three systems, viz.:—that usually called Vauban's first, Vauban's third, and Cormontaigne's, the first drawn, and the last two lithographed.

General profiles of the modern system. One plate.

The modern system.

1. Plan on the largest scale, with every detail.

2. Oblique sections and elevations on various lines drawn on the plan, at the discretion of the instructor.

The attack of fortresses; to be illustrated by its application to a polygon with fronts of the modern bastioned system.

1. Small drawings in detail of the different works used in siege operations, during the construction of which the whole subject of the attack of fortresses is to be explained in a course of lectures.—Three plates.

2. A polygon to be given by the professor, of which the cadet is to make his own attack, which is to be accompanied by a journal of operations, in which the working parties are to be estimated; the different night's work being marked as usual on the plan. Two large plates, the fortress lithographed.

Defence of Fortresses.—One plate, to contain the plan and detail of a blinded battery.

Course of reasoning on the advantages, defects, and relative merits of the French bastioned systems, illustrated by the comparative difficulties a besieger would meet with in attacking them.

Military Mining.

1. A countermined system, viz.:—Dufour's, with explanation of the principles which regulate the construction of countermines generally, and these in particular.

2. Details of mining operations as practised at Chatham.

3. Attack of countermined systems (as given by Dufour).

Additional outworks and detached works; such as tenaillons, counterguards, detached lunettes, horn and crown works, &c.; with explanation of their various uses, and conditions essential in their construction.— One lithographed plate.

Polygonal system.—Two plates.

Cœhorn's system.—Two or three plates.

Graphic operations of defilade, applied in the first instance to a lunette, as a bridge head, afterwards to a front of fortification.

Coast defences, martello towers, tours maximiliennes, casemated hill forts.

Field Fortification, through the whole subject, terminating with an example of a field position, proposed by the professor and fortified by the cadet, who is to give written explanations of the different defensive arrangements he thinks it advisable to make.

The systems of Montalembert, Chasseloup de Laubat, and Carnot.

As the length of time during which cadets remain at the Academy is likely to vary considerably, the Lieutenant-Governor will cause the above course to be abridged or extended, as promotion becomes more or less rapid, in order that those whose period is short may not lose any of the most essential parts of the subject, while others may have the full advantage of the more perfect system of instruction which a lengthened period would afford.

Drawing.

1. Plan Drawing will be based upon the contour system. The course of instruction will be printing, making scales, topographical marks, and conventional signs used in the military plans, representing forms by shadows, drawing from models, copying, enlarging and reducing plans of the most remarkable positions.

2. The Landscape Drawing Masters are to combine model drawing with landscape and sketching from nature. They are to explain to their pupils the simple principles of perspective, light, and shadow, applicable to each drawing they execute, so that when they are advanced to the practical class they may be able readily to make sketches and drawings of the ordnance, carriages, implements, machinery, &c. brought under their notice during the course of instruction.

Under the Professor of Fortification.—Field Works.

The cadets are to be exercised in throwing up in the field various works, the application of which has been taught them in the theoretical course, viz.:—the general arrangement and distribution of working parties; the mode of making fascines and gabions, &c.; tracing and executing first parallel and approaches

of communication; opening second parallel by flying sap; executing different natures of sap; tracing and throwing up batteries with fascines, gabion, and sand-bag revetments; the construction of field powder magazines; laying platforms; profiling and constructing field works; raising French cavaliers; blinding guns; throwing up traverses; and mining. It will not be necessary, after the cadets have acquired the proper mode of using the intrenching tools, &c. that they should complete all the works traced and commenced by them; the more laborious part may be finished on the days the cadets are engaged in other studies, by the party of Royal Engineers employed to assist in the instruction.

Course of Artillery.

The Course Books used by the classes under instruction are—

1. Treatise on Gunnery, with Pamphlet on Rockets, by Lieut.-Col. Boxer, R.A.
2. Plates of Guns, and of the Service of Heavy Ordnance, by Lieut.-Col. Boxer, R.A.
3. Lectures on Artillery, by Major Owen, R.A. and Capt. Dames, R.A.
4. Manual of Artillery Exercises.
5. Hand-book for Field Service, by Col. Lefroy, R.A.

The following are the various branches of instruction:—

1st. Gunnery.

Motion of a projectile in vacuo.
Formulæ for the inital velocities of projectiles.
Principle of the ballistic pendulum.
Principle of the gun pendulum.
Principle of the electro-ballistic apparatus.
Effects of the air's resistance upon the motion of a projectile.
Formulæ for the final velocities of projectiles.
Formulæ for the terminal velocities of projectiles.
Penetrations of projectiles.
Deviations of projectiles.
Theory of rifling fire-arms.
Application of gunnery, including definitions in gunnery, theory of the sighting of ordnance, different kinds of fire, breaching of revetments, &c.

2nd. History, Application, and Organization of Artillery.

History of artillery.
Application of field artillery.
Organization of field artillery.
Application of siege and garrison artillery.
Organization of siege and garrison artillery.

3rd. Practice.

Practice with shot, common shell, and diaphragm shell, from field, siege, and garrison guns.
Hot-shot practice from heavy guns.
Ricochet practice.
Rocket practice (when permitted).

4th. Gunpowder.

Theory of the combustion of a charge of gunpowder.
Explosive force of gunpowder.
Ingredients of gunpowder, their preparation, &c.
Manufacture of gunpowder.
Proofs of gunpowder.

5th. Ordnance.

Principles of construction of ordnance.
Different kinds of ordnance in the service, their weights, charges, &c.
Materials for the construction of ordnance.
Recoil of ordnance.
Manufacture of smooth-bored ordnance.
Manufacture of rifle-bored ordnance.
Proofs of ordnance.
Sighting of ordnance.

6th. Carriages.

Principles of construction of carriages.
Different kinds of carriages in the service.
Effect of the discharge of a gun upon its carriage.
The woods used in the manufacture of carriages.
Manufacture of carriages.

7th. Ammunition.

The construction and manufacture of projectiles for smooth-bored service ordnance.

The construction and manufacture of projectiles for rifled-bored service ordnance.

Fuzes and sabots.
Cartridges and wads.
Tubes and portfires.
Bullets and cartridges for rifled small-arms.
Signal rockets.
Congreve rockets.
Laboratory compositions and processes.

8th. Service of Heavy Ordnance.

Drills with heavy ordnance on different natures of carriages and platforms.

Exercise with the various machines employed for mounting, dismounting, and transporting heavy ordnance.

Mounting and dismounting ordnance with tackle, skidding, &c. without the aid of machines.

As much instruction in the methods of making military bridges as time will admit.

The classes under instruction are to visit the different departments of the Royal Arsenal in succession, so as to acquire a practical knowledge of the details of each operation in the several manufactures.

They are also to visit the gunpowder factory at Waltham Abbey, and, if time permits, the small-arm factory at Enfield.

The gun practice is in future to be carried on at Shoeburyness, as round-shot (from smooth-bore guns) only can now be fired in the range in Plumstead Marshes.

Each operation is to be explained by a short lecture, with the aid of manuscript notes and diagrams, before being seen in the department. These manuscript notes, with copied drawings of sections of ordnance, &c. are to be bound up with the printed lectures on artillery, after the course has been completed.

Rough sketches intended to illustrate the different processes of manufacture are also made by the gentlemen cadets, while under instruction in the several departments of the Royal Arsenal.

The classes under instruction in the "service of heavy ordnance" have the mechanical advantages of the tackles, machines, &c. employed explained to them. Simple mechanical problems connected with the different operations, including the application of levers, tackles, cog-wheels, inclined planes, screws, &c., are also given to the gentlemen cadets for solution.

J. A. Yorke, Col. (Signed) C. H. Owen,
Capt. R.A., and Bt.-Major.

Under the Instructors in Surveying.

The cadets are to be made acquainted with the use of the theodolite and portable instruments best adapted for measuring angles, fixing points, and ascertaining distances in the field, sketching ground from nature in a quick and simple style, and the practice of judging of and ascertaining distances without instruments. To render the cadets expert in these most useful and essential points, the surveying instructor's attention should be particularly directed, and he should be impressed with the importance of correctly surveying the features of a country for military purposes, rather than for the minute delineations required in special surveys. The class should also be instructed in tracing contour lines upon the ground, and in the use of the different instruments issued for the use of the class, including the determination of altitudes by the barometer and barometric thermometer.

Lectures—

On Natural and Experimental Philosophy.

A regular course of lectures on Natural and Experimental Philosophy will be delivered to the cadets in the first and second classes.

These lectures are to be delivered weekly, and be so arranged that the entire course may usually, if not always, be comprehended within the year. They are to be illustrative of the principles of Statics, Dynamics, Hydrostatics, Hydro-Dynamics, and Pneumatics; of the elementary principles of Sidereal and Planetary Astronomy; when circumstances will permit, those of Optics, and of the Phenomena of Magnetism. Principles and theorems, where they admit of it, are to be elucidated by experiments. In all the most interesting cases the mode of operation of mechanical, hydraulic, and pneumatic instruments is to be illustrated by working models capable of exhibiting the proposed effects, as well as of confirming the theoretic truths on which they depend; and the most important applications, especially such as are connected with the military profession, and the construction of military machines, are to be introduced.

On Chemistry.

A course consisting of not less than twenty-five lectures is to be delivered half-yearly to the cadets of the first and second classes.

The object of the lecturer, after explaining the general principles of Chemistry, is to be directed more especially to such subjects as are connected with the professional knowledge necessary for officers of artillery and engineers, and he is to take care that the progressive improvements in Chemistry are embodied in the course.

On Mechanics, Machinery, and Metallurgy, and their Application to Practical Purposes.

Two courses, consisting of twenty lectures each, are to be delivered annually to the cadets of the first class.

The object of these lectures is to be directed to the practical application of the principles of mechanics and machinery, and they are to be illustrated by working models of the various machines treated of, particularly the steam engine, explaining the difference when it is used for stationary, naval, or locomotive purposes, turning lathes, planing and boring machines, &c. &c.

In the lectures on metallurgy specimens of the several metals and their ores are to be exhibited in explanation of the subject, the method of separating the metals from their ores, and the art of working them for military and other purposes, will be particularly dwelt upon and fully explained.

On Mineralogy and Geology.

The course is to consist of twenty lectures, to be delivered to the cadets of the first class.

In this course of lectures the elementary principles of the science will be taught, and specimens of the several classes of minerals, geological strata, and of the different metals and their ores, will be exhibited in explanation of the subject treated of.

Appendix XI.

Examination Questions.

Mathematics.—By the Professor of the Royal Military Academy.

1. If shot be piled on a triangular base each side of which contains 20 shots, find the whole number in the pile.

2. Define the term discount. If the interest of 1,000*l.* for a year be equal to the discount on 1,050*l.* for the same time, find the rate of interest.

3. In how many ways can five persons form a ring?

If three prisoners are in charge of two corporals, and all five sit miscellaneously round a fire, find the chance that the prisoners will not all sit together.

4. The two sides of a parallelogram are 50 feet, 60 feet, and the length of one of the diagonals 76 feet. Find the remaining diagonal.

5. If s is the semi-perimeter, a, b, c the sides of a triangle, prove the formula $\cos\frac{A}{2}=\sqrt{\frac{s(s-a)}{bc}}$.

6. A man ascends a mountain a mile high by a direct path, which slopes at first 7° 30′ to the horizon, then suddenly changes to 15°, and so continues up to the top, on arriving at which he finds the angle of depression of the point from which he started to be 10°. Find the length of the ascent.

7. Assuming the diameter of our globe to be 8,000 miles, and the constitution of its interior to the depth of 10 miles to be understood, determine the ratio of the content of the known to that of the unknown part of the same.

8. Show that for any positive integer value of m,

$$(\cos\theta+\sqrt{-1}\sin\theta)^m=\cos m\theta+\sqrt{-1}\sin m\theta.$$

9. Give a definition of a parabola, and determine its equation therefrom.

10. Find a point in the ellipse at which the tangent is equally inclined to the major and minor axes.

11. If tangents are drawn to the parabola $y^2=4ax$ from the point h, k, prove that the equation to the chord of contact will be $ky=2a(x+h)$.

Mathematics.—By the Professor of the Royal Military Academy.

1. Inscribe a circle in a given triangle.

2. In a right-angled triangle, if a perpendicular be drawn from the right angle to the base, the triangles on each side of it are similar to the whole triangle and to one another.

3. If a line be drawn parallel to the base of a triangle, it will cut the sides or the sides produced proportionally.

4. If two straight lines be parallel, and one of them be at right angles to a plane, the other will also be at right angles to the same plane.

5. Given the total surface of a cylinder. Find its form that its volume may be a maximum.

6. Define the meaning of an asymptote to a curve, and show that if the equation to a curve can be thrown under the form $y=Ax+B+\frac{C}{x}+\frac{D}{x^2}+\ldots$, the line $y=Ax+B$ will be an asymptote.

7. Integrate the following expressions:—

$$ax^{\frac{1}{2}}+bx^{\frac{1}{3}};\ \frac{x^3}{(1+x)^2};\ \frac{x^4}{1+x^2}.$$

8. Integrate the following quantities:—

$$x\sqrt{a+x},\ n^3(\log x)^2,\ (\sin\theta)^2,\ (\cos\theta)^3.$$

9. The equation to the Witch of Agnesi being—

$$xy^2=4a^2(2a-x),$$

find the whole area between the curve and its asymptote.

10. Find the length of the arc of a parabola from its vertex to the extremity of its latus rectum.

11. Determine what fraction of the whole surface of the terrestrial globe may be seen by a person elevated $\frac{1}{12000}$th part of its radius above it.

Mathematics.—By the Professor of the Royal Military Academy.

1. Establish the equation to the path of a projectile *in vacuo*, $y=x\tan\alpha-\frac{x^2g}{2v^2(\cos\alpha)^2}$.

2. The velocity at the point P of the path of a projectile being 20, and at the point Q, 30 feet per second, determine the difference between the altitudes of P and Q above a given horizontal plane.

3. The greatest range of a rifle-ball on level ground being 1,200 feet, determine its initial velocity.

4. If the length of a seconds' pendulum be 39·140 inches, find the value of g to three places of decimals.

App. XI.

Royal Military Academy.

5. A pendulum is found to make 640 vibrations at the equator in the same time as it makes 641 at Greenwich. If a string hanging vertically can just sustain 80 pounds at Greenwich, how many pounds can it sustain at the equator?

6. A pipe 15 feet long, closed at the upper extremity, is placed vertically over a tank of the same height; the tank is then filled with water, which is observed to rise 3 feet 9 inches in the pipe. Determine the height of the water barometer.

7. If the receiver and the barrel of an air-pump are in the proportion of 7 to 2, find what proportion of the air has been pumped out at the end of the fourth stroke.

8. The apparent weight of a sinker weighed in water is four times the weight in vacuum of a certain specimen of a homogeneous substance; that of the sinker and piece together is three times that weight. Find the specific gravity of the substance.

9. The specific gravities of platinum, gold, and silver being taken at 21, 17·5, 10·5, and the value of an ounce of each at 30*s*., 80*s*., 5*s*. respectively, find the value of a platinum and silver coin which has the same weight and bulk as a sovereign.

10. Apply Napier's rules to obtain the hypothenuse of a right-angled spherical triangle in terms of the sides, and an angle in terms of the hypothenuse and the opposite side.

11. The spherical excess of a triangle being $1\frac{1}{2}$ second, find its area, the earth's diameter being taken to be 7,757 miles.

Mathematics.—By the Professor of the Royal Military Academy.

1. A stationary engine of 96 horse-power draws a weight of 150 tons along a horizontal level at the rate of 30 miles per hour. Find the amount of friction per ton.

2. A ton of coal has to be raised from a pit 400 feet deep by a rope which weighs $1\frac{1}{2}$ lb. per foot. Find the number of units of work expended in raising it, and the horse-power required to raise it in 5 minutes.

3. State Guldin's properties, and apply his rule to find the area and volume of the figure described by an isosceles triangle whose equal sides are 3 feet and base 2 feet in length, revolving about a line exterior to the triangle, parallel to and at a distance of 1 foot from the base.

4. A wheel and axle weigh 4 cwt.; the radius of the wheel is 3 feet, of the axle 8 inches, and of the axis round which they revolve 1 inch. Find the force in lbs. that must be exerted to raise a weight of 2,000 lbs., the co-efficient of friction between the axle and axis being $\frac{1}{5}$.

5. A roof formed by two rafters and a tie-beam supports a load of 2 tons, equally distributed along the rafters, whose inclination to the horizon is 30°. Find the horizontal thrust on the tie-beam.

6. Assuming the formulæ for a body projected vertically upwards and vertically downwards in a medium whose resistance varies as the square of the velocity; viz.:—

$$x=\frac{\mu^2}{2g}\log_e\frac{\mu^2+V^2}{\mu^2+v^2};\quad x=\frac{\mu^2}{2g}\log\frac{\mu^2-V^2}{\mu^2-v^2};$$

Find the velocity which a body projected upwards with a velocity V will have lost when it returns to the point of departure.

7. Two equal and similar bodies are thrown vertically at the same moment, one from the top, the other from the bottom of a tower. Show that if the resistance of the medium in which they move varies as the first power of the velocity, the time in which they meet will be independent of the force of gravity.

8. Find the moment of inertia of a sphere about any tangent to its surface.

9. Find the time of oscillation of a cube about one of its sides.

10. State the law according to which, if the motion of a body acted on by given forces be separated into a motion of translation and a motion of rotation about the centre of gravity, the two may be separately reduced to calculation.

How may the motion of a wheel rolling on a plane be separated in the manner above named?

11. A square, 6 feet in each direction, is suspended about an axis passing through one of its angles and parallel to a diagonal. Where must it be struck so as to produce no shock on the axis?

GEOMETRY AND ALGEBRA.—Rev. W. N. GRIFFIN, M.A.

1. If from the ends of the sides of a triangle two straight lines are drawn to a point within the triangle, these two straight lines shall be less than the other two sides of the triangle but shall contain a greater angle.

State the purpose of a proposition in the Third Book, where this proposition is used.

2. If a straight line be bisected and produced to any point, the rectangle contained by the whole line produced and the part of it produced, together with the square on half the line bisected, is equal to the square on the line made up of the half and the part produced.

3. Upon a given straight line to describe a segment of a circle containing an angle equal to a given rectilineal angle which is greater than a right angle.

4. Given three points, A, B, C, in one plane. Construct a point at a given distance from A where the distance of B and C subtends a given angle. Point out the circumstances under which there may be one solution, two solutions, or none.

5. Define duplicate ratio. Find the ratio of which 3 : 4 is the duplicate ratio.

6. Find the ratio of $a : b$ which will allow $a^3-2\,a^2b+5\,ab^2-15\,b^3$ to be divisible by $a^2-3\,ab+b^2$.

7. Find a number of two digits whose sum is 10, while, if they be inverted, the number becomes greater by 36.

8. Two candidates, A and B, compete in an examination wherein some subjects are obligatory and others voluntary. A's marks exceed B's by 350, and if A had obtained no marks in the voluntary subjects his advance before B would have been 300 marks less; also, if A had gained half as many marks again in obligatory subjects, his marks would have doubled B's marks. The sum of their obligatory marks is to the sum of their voluntary marks as 30 : 7. Find the number of marks which each candidate obtains.

9. Investigate the sum of a series of quantities in geometrical progression.

Find a quantity to be taken from each of three given quantities, a, b, c, that the remainder may be in geometrical progression.

Explain the meaning of the result if a, b, c are in arithmetical progression.

10. Reduce the roots of the equation

$$x^3-x^2-x-2=0$$

by such a quantity that the transformed equation may want the second term, and then find by Cardan's method the three roots of the given equation.

SPHERICAL TRIGONOMETRY, DIFFERENTIAL AND INTEGRAL CALCULUS, MECHANICS AND HYDROSTATICS.—Rev. W. N. GRIFFIN, M.A.

Extra Course.

1. Define the polar triangle of a spherical triangle, and prove that this latter is conversely the polar triangle of the former.

2. Prove that in a spherical triangle—

$$\cos A \sin b \sin c = \cos a - \cos b \cos c.$$

3. Investigate the conditions which determine when a function of two independent variables is a maximum or minimum.

Ex. Find the maximum or minimum value of—

$$(xy+2)(x+y)-(x+y)^2-xy.$$

4. Define the circle of curvature of a plane curve, and obtain an expression for its radius.

App. XI.
Royal Military Academy.

Find the ratio of the radii of curvature at the ends of the major and minor axes of an ellipse.

5. Integrate the following with regard to x:—

(1) $\frac{x\,dx}{\sqrt{1-x^4}}$ (2) $\frac{\sqrt{x}\,dx}{a+x}$ (3) $\frac{dx}{\cos 2x}$ (4) $x\sin^2 x\,dx$.

6. Find the position of the centre of gravity of the arc of a semicircle.

7. A wall is 14 inches thick for the lower 12 feet of its height, and 9 inches thick for the upper 8 feet, the inner face being in one vertical plane. It has to bear at the top a horizontal pressure from within of 192 lbs. on the lineal foot, and at the height of 14 feet it is tied to an opposite wall by horizontal rods 10 feet apart. The weight of a cubic foot of the wall being 120 lbs., find the tension which each horizontal rod must be able to bear to make the wall secure.

8. When a beam is deflected by a given force perpendicular to its length, find the radius of curvature of the neutral line at any point.

A rectangular plank 1 foot in breadth, 4 inches in depth, and 12 feet long, weighing 200 lbs., rests upon two supports at its ends, which are in one horizontal plane. Find the depression of its centre below its ends, the modulus of elasticity being one million.

9. A chain of uniform density, two feet long, has its ends attached to fixed points in the same horizontal plane, and the tension at its middle point is three times its own weight. Find the distance of its middle point below the horizontal line through its end.

10. A vertical cylindrical vessel contains fluid. Find the relation between the pressure and the tension.

Ex. A cylindrical boiler of 2 feet radius contains steam at a pressure of six atmospheres. Find the tension at any point. If a short vertical rod of the same metal as this boiler has a section of 2 square inches, what weight must be hung from it that the metal may be in the same state of tension as in the boiler, where it is ·4 inches thick?

Co-ordinate Geometry, Trigonometry, Mensuration, Differential Calculus.—Rev. W. N. Griffin, M.A.

1. Find the equation to a straight line making a given angle a with the axis of x, and having the perpendicular upon it from the origin of given length c,

2. Show by the method of co-ordinate geometry, that if two circles cut one another in one point, they must cut one another again.

3. Find the polar equation to a circle, the pole being a given external point, and the spiral angle being measured from the diameter through that point. Hence find the angle between the tangent drawn from the pole, and the straight line from which the spiral angle is measured.

4. Compute the value of cos 72° to three places of decimals.

5. Find the values of A which satisfy the equation

$$2\sin 3A\cos A = \sin 2A.$$

6. Express the cosine of a an angle of a triangle in terms of the sides. Hence show that in a right-angled triangle when c is the hypothenuse,

$$\tan^2\frac{A}{2} = \frac{c-b}{c+b}.$$

7. Prove that the area of a quadrilateral of which two sides are parallel is the product of the semi-sum of the parallel sides into their distance.

Ex. The parallel sides being 3 chains 18 links and 4 chains 22 links, their distance 1 chain 3 links, find the area in acres.

8. If a straight line of 2 feet length be placed in a circle whose radius is 4 feet, compare the lengths of the portions into which the circumference of the circle is divided.

9. If the inscribed circle be cut out from a regular decagon, compare the area which remains with the original area.

10. Prove from the definition of a differential coefficient that if

$$u = \tan\theta, \frac{du}{d\theta} = \sec^2\theta.$$

11. Expand by Maclaurin's theorem $\tan^{-1}\theta$ in ascending powers of θ to three terms. How is this expansion used to compute the numerical value of π?

MECHANICS AND HYDROSTATICS.—Rev. W. N. GRIFFIN, M.A.

1. A cube stands on a horizontal table. Find the greatest portion that can be cut from it by a plane through one of the horizontal upper edges that the remainder may not fall over.

2. Find the greatest weight which can be supported on a screw by a given power acting at a given arm perpendicularly to the axis of the screw, the co-efficient of friction (μ) between the thread of the screw and the companion in which it works being known.

If the uniform angle which the tangent to the thread of the screw makes with the axis be $\text{cotan}^{-1}\mu$, explain the result.

3. Two equal and similar wedges of given weight lie on a rough horizontal table with their edges contiguous, and when a smooth sphere of given weight is placed between them, they are just not separated. Find the angle between the faces of either wedge, the coeffieient of friction between the wedges and the table being known.

4. A uniform bar AB, 4 feet in length and 8 lbs. in weight, rests in a horizontal position on a support A at one of its ends, and on another support C at the distance of 1 foot from the other end B. Find the moment of the strain at the middle point of AC.

5. Explain the objects of the three laws of motion, and the nature of the evidence whereby we are assured of their truth.

6. Explain the sense in which gravity is called a uniform force. Where would be the fallacy in thence concluding that all bodies at the same place have the same weight?

7. The vertical line in which a body falls from rest being divided into equal portions, and the time of falling through the 5th of these being a second, find the time of falling through the 10th portion.

8. A ball of given elasticity impinges obliquely on a smooth plane, find the change in its velocity.

Ex. The angle between the plane and the body's direction at incidence being 30°, and the elasticity $\frac{1}{2}$, what portion of the velocity is lost?

9. An ounce is taken of each of two liquids whose specific gravities are 3·6 and 1·2. Find the specific gravity of the mixture when they are united.

10. The pressure of a liquid on any plane surface immersed in it is the weight of a column of the liquid whose base is the area under pressure, and its height is the depth of the centre of gravity of the area below the surface of the liquid.

A vessel contains 4 inches in depth of mercury, and 3 inches of water above it. In the mercury there is a thin circular disc of 1 inch radius, with its centre 5 inches below the upper surface of the water. Find the pressure on either face of the disc, the specific gravity of mercury being taken as 13·5.

If the disc has a thickness of $\frac{1}{10}$ inch, what is the resultant pressure upon it?

[In this and the following question the weight of a cubic foot of water may be taken as 1,000 ounces.]

11. A hemispherical cup of 4 inches diameter is filled to half its depth with water. Find the resultant pressure exerted by the water on the inner surface of the cup, taking into account the atmospheric pressure of 15 lbs. on the square inch.

DESCRIPTIVE GEOMETRY.—Captain MARSH, R.E.

Morning Paper.

1. Construct a triangle with sides measuring $2\frac{1}{2}$, 2, and $1\frac{1}{2}$ inches. Draw its horizontal projection when so situated that the area of the projection is

App. XI.

Royal Military Academy.

half that of the triangle; and measure by construction the inclinations of its sides to the horizontal plane.

2. Four points, *a*, *b*, *c*, *d*, of which the horizontal traces are distant—*a* to *b*, $3\frac{1}{2}$; *b* to *c*, 2; *c* to *d*, 2; *d* to *a*, $3\frac{1}{2}$; and *a* to *c*, 4 inches; have numbers respectively of 17, 13, 21, 3, denoting their heights above the horizontal plane. Draw the scales of slope of two planes, each containing any three of these points. Draw also the line of intersection of these planes, and measure by construction the angle contained by the planes, and the angle made by each plane with the horizontal plane.

3. Construct a square of 2-inch side; this is the horizontal projection of a cube; turn it over until one of its diagonals is vertical. Determine by construction the minimum slope of a plane perpendicular to one of the upper faces. Draw the scale of slope of a plane perpendicular to one of the upper faces, and making an angle of 70° with the horizontal plane, and draw the horizontal projection of its intersection with that face.

Descriptive Geometry.—Captain Marsh, R.E.

Afternoon Paper.

1. Draw the profile of an epaulment to cover cavalry with dimensions as follows:—

Parapet 12 feet thick, and 4 feet high.

Superior slope $\frac{1}{12}$. Exterior slope $\frac{3}{4}$. Interior slope $\frac{4}{1}$.

Find by construction the width at top and bottom of a ditch to be excavated inside the epaulment 4 feet deep, and of the same area as the epaulment, and therefore yielding sufficient earth for its construction, supposing the excavated earth not to alter in bulk when built up. The rear slope of ditch to be $\frac{1}{2}$, the front slope $\frac{2}{1}$, leaving a berm of 1 foot at the bottom of the interior slope of the epaulment. Draw the profile of ditch. Scale $\frac{1}{48}$.

2. (On a separate paper.)

Draw across the width of the paper thin Indian ink lines to represent contours. Let them be slightly curved, nearly parallel, and at distances apart varying from $\frac{1}{2}$ to 1 inch. Number them from the bottom 0, 1, 2, &c., indicating their vertical intervals apart in feet.

Draw any straight line 8 inches long, making angles of about 80° with the contours, and in the centre of the paper. This is the trace of the crest of the epaulment in question 1. Draw the epaulment and ditch showing the contours, making the end slopes $\frac{2}{3}$ in all cases, and show a ramp 4 feet wide into the ditch, and not exceeding a slope of $\frac{1}{6}$. Scale $\frac{1}{120}$.

3. Draw the scale of slope of a plane containing both the crest line of the epaulment (question 2), and the paths of shot passing through the crest into the work at right angles to the trace and falling $\frac{1}{20}$.

Practical Geometry.—By the Professor of the Royal Military Academy.

The constructions must be accurate, distinctly showing the principles employed, and all points, &c., determined, must be figured and lettered. Unit ·1 inch.

1. The *plans* of two lines contain an angle of 115°; the lines themselves are at right angles; if one is inclined at 40°, what is the inclination of the other?

2. Two adjacent corners and the centre of a square of 2·5 inches side are 9; 16; 23 units above the horizontal plane; draw its plan and an elevation on a plane from which the two corners are 14, 20 units distant.

3. A regular pentagon of 15 units side is inclined to the horizontal plane at such an angle that the *plans* of two adjacent sides are to the sides themselves as $\frac{7}{8}$; $\frac{10}{11}$. Draw its plan.

4. An hexagonal prism 4 inches long, base 1·5 inches, is to be shown by a plan and elevation in one only of the following positions :—

a. The edges inclined at 50°, one side of base at 20°.

b. The planes of the base, and that containing any two edges inclined at 60° and 50°.

c. The plane of one face vertical, and the edges inclined at 75°.

5. A sphere of 20 units radius rests on the h : p, and is touched by a cylinder of 12 units radius also lying on that plane; determine a second plane tangential to both surfaces.

6. A traverse 13 yards long stands on ground sloping to the front $\frac{1}{12}$: the command at one end is 8 feet, at the other 7 feet; the crest is inclined at $\frac{1}{15}$ thickness of parapet 15 feet, one end to be $\frac{5}{4}$, the other $\frac{3}{2}$, superior slope $\frac{1}{5 \cdot 8}$; banquette double rank; the other slopes as usual. Show the work by a contoured plan for every foot of level. Scale $\frac{1}{84}$.

Second Paper.

1. If the traces of a plane make angles of 60° and 75° with the ground line, what angles does the plane make with each plane of projection, and what is the angle contained by the traces themselves?

2. The *plan* of a line inclined at 50° makes an angle of 30° with the ground line, and meets the horizontal plane in a point 26 units from the vertical plane; draw its elevation, and determine two planes 30 units apart perpendicular to it.

3. The planes of two squares of 20 units side, and having one diagonal in common, are perpendicular to each other; one is inclined at 60°; draw their plans.

4. A cone 35 units high, radius of base 10 units, lies on its side on the horizontal plane; draw its plan, and determine a tangent plane inclined at any oblique angle; mark the line of contact.

5. The platform for a mortar 12 feet by 8 is formed of 3·5 inch plank spiked down on four equidistant sleepers 7 by 4·5 inches; these sleepers are laid on the heads of 12 piles 4·5 inches square and 5 feet long; show the work in isometrical projection to a scale of $\frac{1}{12}$.

N.B.—The planks to be left out over half the platform in order to show the work below.

6. Construct a scale of $\frac{1}{144}$ to show chains and links, and a comparative scale of feet and inches.

N.B.—There are 100 links in a chain; a chain is 66 feet long.

7. Construct a triangle from one of the following conditions :—

a. The area 5 inches, the sides as 1; 1·5; 1·75.

b. The area 5 inches, the vertical angle 60°.

c. The perimeter 7 inches, vertical angle 60°, sides as 5 : 7.

FRENCH.—M. ESQUIROS.

I.

Traduisez en Anglais :—

Certes Napoléon ne fut dans ces jours funestes (1813) ni moins fécond en vastes combinaisons, ni moins énergique, ni moins imperturbable dans le danger; mais il fut toujours l'ambitieux dont les insatiables désirs troublaient et pervertissaient l'immense génie. En 1812, pour avoir entrepris l'impossible il essuya un revers éclatant. En 1813, pour ne pas se borner à réparer ce revers, mais pour vouloir l'effacer tout entier et tout d'un coup, il s'en prépara un second aussi éclatant et plus irréparable, parceque ce dernier emportait jusqu'à l'espérance. Il ne lui en fallait plus qu'un pour arriver au fond. Napoléon s'arrêterait-il sur cette pente fatale? Les coalisés étaient résolus à lui offrir la

France, la vraie France, celle qu'enferment et protègent si puissamment le Rhin et les Alpes, celle que la révolution lui avait léguée et dont après Marengo et Hohenlinden il s'était contenté. S'en contenterait-il en 1814? Telle était la dernière question que le sphinx de la destinée allait proposer à son orgueil.—*Thiers.*

II.

1. Quelle est la règle qui régit en français la formation des noms composés? Appliquez cette règle en traduisant *railway, paper-knife, drinking-glass, steam-boat, percussion-gun.*

2. Quelle est la différence entre *en* et *y*? Appuyez votre réponse sur des exemples.

3. Qu'entendez-vous par temps primitifs? Ecrivez ceux des verbes *combattre, mouvoir, peindre, plaire, servir.*

4. Quelles sont les différentes manières de traduire *but* dans les phrases suivantes: I can *but* yield to circumstances. The last house *but* one in the street. I little doubt *but* that he will succeed. He was second to none *but* Frederick the Great. She did not answer, *but* she acted accordingly.

5. Indiquez en anglais le sens de ces expressions: Marcher au pas de charge. Faire volte face devant l'ennemi. Tirer à ricochets. Enclouer un canon. Ce n'est pas tout que de frapper fort, il faut viser juste. Les pièces de campagne sont montées sur des avant-trains.

6. Quelle est la place des adverbes dans une phrase française, quand ils accompagnent un verbe employé soit à un temps simple, ou à un temps composé? Répondez par des exemples.

III.

Décrivez, sous forme de lettre, les principaux services que rendent dans un siége le génie et l'artillerie. Signalez en même temps quelques uns des progrès qu'a faits, depuis Vauban, l'art de prendre les villes.

IV.

Traduisez en français:

As for Louis the Great, he is more than mortal. Lift up your glances respectfully, as he passes through the great gallery where Villars, and Vendome, and Berwick, and Bossuet, and Massillon are waiting. Can Court be more splendid, nobles and knights more gallant and superb? A grander monarch, or a more miserable starved wretch than the peasant, his subject, you cannot look on. Let us bear both these types in mind, if we wish to estimate the old society properly. Remember the glory and the chivalry? Yes! Remember the grace and beauty, the splendour and lofty politeness, the gallant courtesey of Fontenoy, where the French Line bids the gentlemen of the English Guard to fire first; the noble constancy of the old King and Villars his general, who fits out the last army with the last crown-piece from the Treasury, and goes to meet the enemy and die or conquer for France at Denain. But around all that royal splendour lies a nation enslaved and ruined.—*Thackeray.*

French.—By the Professor of the Royal Military Academy.

Traduisez en français:

The Earl of Essex.

Elizabeth, endowed by nature with indomitable courage, and taking especial delight in deeds of heroism, lavished upon the successful commanders of her fleets and armies numerous marks of favour. Among them all, however, there was not one who stood so high in her affections as the young Earl of Essex. She had raised him at the age of twenty-one to the rank of Captain General, and treated him with a degree of fondness which resembled that of a mother for a spoiled child. Nor did Essex himself bear a trivial resemblance to the object of a doting mother's love. Brave, impetuous, accomplished, he was at

the same time stubborn, irritable, and proud; one who often quarrelled with his best friends about the turn of a straw, and as often repented of his rashness. He certainly ranked amongst the warriors who had most contributed to raise the military glory of their country, yet was his reputation that of a fearless rather than of a skilful soldier. Be his rank what it might, he took his station wherever the battle raged, and these extraordinary attainments could not fail to make a profound impression on the romantic mind of the Queen. Thus, when the death of Leicester had dissolved the tie in which her happiness was supposed to have been wrapped up, it was seen without great surprise that the new favourite soon made her forget her grief, together with him who was the cause of it.

Questions Grammaticales.

1. En quoi le pronom relatif *qui*, se distingue-t-il du pronom interrogatif *qui*, et comment déclinez-vous ces pronoms?
2. Quelles sont les conjonctions qui demandent le verbe qui les suit au subjonctif, précédé de *ne?*
3. Ecrivez l'impératif affirmatif et négatif des verbes: *se promener, se battre, s'en aller.*
4. Donnez la règle de l'accord du participe passé d'un verbe suivi d'un infinitif, et prouvez la par un exemple.
5. Comment traduisez-vous le verbe *to have*, séparé d'un participe passé par un substantif ou un pronom, comme dans cette phrase: *I must have my gloves mended.*
6. Quelle est la signification des Gallicismes: *être aux petits soins, se mettre en quatre, battre la campagne?*

Ecrivez quelques lignes sur le voyage de Garibaldi en Angleterre et son séjour à Londres.

Alphonse Lovey.

French.—Dictée.

Alliance de Cromwell avec la France, 1658.

La France et l'Espagne se disputaient alors l'alliance de l'Angleterre, devenue république, et que gouvernait Cromwell en qualité de lord protecteur. Charles I. était mort sur l'échafaud en 1649, pour avoir voulu rendre son autorité absolue et tenté d'abolir la religion presbytérienne en Ecosse. Cromwell avait puissamment contribué à cette grande catastrophe, et exerçait tout l'ascendant que peut obtenir dans les révolutions politiques un génie profond et rusé, plein d'enthousiasme et d'audace; peu d'années lui suffirent pour rendre l'Angleterre florissante, et lui donner une haute influence en Europe. Il mit à prix son alliance, et Mazarin l'emporta sur Philippe IV. en promettant de livrer Dunkerque aux Anglais si cette place était reprise par la France, et d'abandonner la cause des deux fils de Charles I. tous deux petits-fils de Henri IV., et qui passèrent du camp de Turenne dans celui de Condé. Cromwell à ces conditions donna aux Français une flotte de six mille soldats. La Flandre fut encore le théâtre de la guerre; et la bataille des Dunes, où Turenne triompha de son illustre rival, fit tomber Dunkerque aux mains du vainqueur, qui la remit sur-le-champ aux Anglais. Cette victoire, suivie de la prise d'un grand nombre de places, décida Philippe à la paix, également nécessaire aux deux royaumes.

Traduisez en anglais:

Observations sur le XVIe Siècle.

A ne voir que la suite des guerres et des événemens politiques, le 16e siècle est un siècle de sang et de ruines. Il s'ouvre avec la dévastation de l'Italie par les troupes mercenaires de François I. et de Charles Quint, avec les affreux ravages de Soliman qui dépeuple annuellement la Hongrie. Puis viennent ces luttes terribles des croyances religieuses, où la guerre n'est pas seulement de peuple à peuple, mais de ville à ville, et d'homme à homme, où elle s'intro-

duit jusqu'au foyer domestique, et jusqu'entre le fils et le père. Celui qui laisserait l'histoire dans cette crise croirait que l'Europe va tomber dans une barbarie profonde. Et loin de là, la fleur délicate des arts et de la civilisation grandit et se fortifie au milieu des chocs violents qui semblent près de la détruire. Le caractère du 16e siècle, ce qui le distingue profondément de ceux du moyen-âge, c'est la puissance de l'opinion; c'est alors qu'elle devient véritablement *la reine du monde*. Henry VIII. n'ose point répudier Catherine d'Aragon avant d'avoir consulté les principales Universités de l'Europe. Charles Quint cherche à prouver sa foi par la persécution des Maures, pendant que ses armées prennent et rançonnent le pape. François I. élève les premiers bûchers où sont montés les Protestants de France, pour excuser aux yeux de ses sujets et aux siens ses liaisons avec Soliman et les Luthériens d'Allemagne. Ces actes même d'intolérance étaient autant d'hommages rendus à l'opinion.

GERMAN.—Rev. C. SCHÖLL, PH. DR.

I.

Translate into English:

Gustav Adolf war ohne Widerspruch der erste Feldherr seines Jahrhunderts und der tapferste Soldat in seinem Heere, das er sich selbst erst geschaffen hatte. Mit der Taktik der Griechen und Römer vertraut, hatte er eine bessere Kriegskunst erfunden, welche den größten Feldherren der folgenden Zeiten zum Muster diente. Die unbehilflichen großen Escadrons verringerte er, um die Bewegungen der Reiterei leichter und schneller zu machen; zu eben dem Zwecke rückte er die Bataillons in weitere Entfernungen aus einander. Er stellte seine Armee, welche gewöhnlich nur eine einzige Linie einnahm, in einer gedoppelten Linie in Schlachtordnung, dass die zweite anrücken konnte, wenn die erste zum Weichen gebracht war. Den Mangel an Reiterei wußte er dadurch zu ersetzen, daß er Fußgänger zwischen die Reiterei stellte, welches sehr oft den Sieg entschied. Die Wichtigkeit des Fußvolks in Schlachten lernte Europa erst von ihm.

II.

Translate into German:

Camp at Steinham,
17*th August* 1704.

Sir,—I hope, long before this comes to hand, my Lord Tunbridge will have brought you the good news of our great victory over the enemy (at Blenheim). The success appears every day greater, and the number of prisoners increases hourly, for the soldiers that in the rout dispersed themselves into the country, finding no safety there, come and surrender themselves, so that we reckon now about 11,000, besides near 1,200 officers. The marshal, with some other of the chief officers, will be going on Tuesday morning to Francfort and Hanau. I shall send a captain with forty or fifty English horse for their guard. We have observed this day in devotion for returning thanks to God for our success, and concluded it with a triple discharge of all our artillery and small arms.

I am with truth, sir,
Your most faithful and most humble servant,
M.

III.

Questions Grammaticales.

1. Decline welcher Soldat.

2. Give the gender, the meaning, and the nominative plural of Bach, Buch, Bruch, Buche, and Becher.

3. Give the first person of the imperfect indicative and the past participle of biegen, beugen, brechen, sollen, wissen, and grüßen.

4. Point out the mistakes in the following sentences:

Der Knabe macht mich viel zu ſchaffen. Wenn ich ihm etwas thun heiße, er will gehorchen nicht. Er immer thut das Gegentheil von was ich ihm ſage.

IV.

Write, in German, an Essay on Temerity and Courage.

German.—By the Professor of the Royal Military Academy.

Translate into English:

(1) Alſo ſprachen unter ſich die Reiſenden im Zelte; die Wachen aber, die um den Lagerplatz aufgeſtellt waren, begannen unruhig zu werden. (2) Ein ziemlich bedeutender Haufe bewaffneter Reiter zeigte ſich in der Entfernung von einer halben Stunde; ſie ſchienen gerade auf das Lager zuzureiten. (3) Einer der Männer von der Wache ging daher in das Zelt, um zu verkünden, daß ſie wahrſcheinlich angegriffen würden. (4) Die Kaufleute beriethen ſich unter einander, was zu thun ſei, ob man ihnen entgegen gehen oder den Angriff abwarten ſolle. (5) Achmet und die zwei ältern Kaufleute wollten das letztere, der feurige Muley aber und Zaleukos verlangten das erſtere und riefen den Fremden zu ihrem Beiſtand auf. (6) Dieſer zog ruhig ein kleines blaues Tuch mit rothen Sternen aus ſeinem Gürtel hervor, band es an eine Lanze, und befahl einem der Sklaven, es auf das Zelt zu ſtecken; er ſetze ſein Leben zum Pfande ein, ſagte er, die Reiter werden, wenn ſie das Zeichen ſehen, ruhig vorüber ziehen.

Translate into German:

Muley did not believe in the result; the slave, however, stuck the lance on the top of the tent. Meanwhile, all who were in the camp had seized their arms, and looked in anxious expectation for the arrival of the horsemen. But these, it appeared, had seen the signal on the tent, for they turned suddenly aside from the direction towards the camp, and drew off by a wide sweep (Bogen) on the one side.

The travellers stood astonished for a few moments, and looked now at the horsemen, now at the stranger. The latter stood quite calm outside the tent, and looked over the plain, as if nothing had happened. Muley broke the silence, saying: "Who art thou, mighty stranger, that thou canst thus by a nod tame "the wild hordes of the desert?"

Grammatical Questions.

1. Point out, in the first and second sentences, all the substantives, and indicate their respective cases and number.

2. Point out, in the third sentence, the verbs and their respective tenses, persons, and number. Conjugate in full "Angreifen"

3. Point out, in the fourth and fifth sentences the pronouns, and indicate their respective cases and number.

4. Point out, in the sixth sentence, the propositions, and the cases they govern therein.

5. Explain when in German the subjunctive mood is used.

Essay.

Write a few sentences on the advantages we derive from travelling in foreign countries, both in point of health and mental improvement.

Hindustani.

Grammatical Questions.

1. To what cases does the termination وں belong? and are there any nouns which take it in any case to which the ordinary rule does not apply? and what meaning does it generally impart?

App. XI.
Royal Military Academy.

2. What compound verbs are formed from the root? Give examples.
3. Do adjectives when they precede their substantives take the plural terminations آن — ين — ون. Give examples.
4. When several nouns of different genders occur in a sentence, what gender and number does the verb take?
5. Explain the various rules for converting neuter verbs into active or casual or double casual. Give an example of each rule.
6. Write out in the Persian character, 18, 28, 39, 48, 89, 94; and express in fractional terms, 525 and 3500.

To be translated into English without Dictionary.

A.

صُبح کو هم نے ایک مرد اور ایک عَورت کو دیکھا کہ ایک ٹوکرا روٹِي اور ایک گھڑا پانِي کا لِئے هُوئے هماري پاس آ پہُنچے — اَور هر ایک زخمِي کو اُس عَورت نے ٹوکري مِیں سی کُچھ روٹِي اور گھڑے مِیں سے کُچھ پانِي دِیا * هم لوگون کو بھِي اُسنے اُسِي طرح دِیا — هم نے خُدا کا اَور اُسکا شُکر کِیا — لیکِن صُوبہ‌دار صاحِب نے جو ایک اعلِي ذات کي راجپُوت تھے اُس عَورت سے جو ادنا ذات تھِي روٹِي پانِي کُچھ نے لِیا هم نے اُنکو سمجھایا کے وُہ اُس روٹِي اور پانِي کو لیوِیں تاکہ زِندہ رهِیں مگر اُنھون نے کہا چند گھنٹے مرنے مِیں هم کو باقِي هَین کم و زِیادہ دُکھ سے هم کو کیا ۞

B.

مُجھے حُکم کِیا کہ زناني محلّ مِیں رها کرے — جب تک جوان نے هو باهِر نے نِکلے ۞

اُسنے مُجھے گلے سے لگا لِیا اور آنسو آستِین سے پونچھے اَور کہا کے مَیں تُمھیں پادشاہ پاس لیچلُون ۞

اغلب هَے کہ وہ دوستِي تُمھاري باپ کِي یاد کرکر ایک بندر جو باقِي هَے تُجھے دے — تب اُن کِي مدد سے تیرا مُلک تیرے هاتھ آوے ۞

اگر مُجھے اِس فِکر سے تُو چھُڑاویگا تو اِس خِدمت کے عِوض بہت کُچھ پاویگا ۞

To be translated into Hindūstānī with Dictionary.

A.

It was about three o'clock in the afternoon when I fell, and I remained insensible till morning. When I came to myself I remembered what had happened, for several other wounded soldiers were lying near me. I crawled under a bush to shelter me from the sun. Two men of my battalion crept near me; the one, a Soobahdar, that had his leg shot off below the knee; the other, a Jemadar, had a spear wound through his body. We were dying of thirst, but not a soul was to be seen; and in this state we remained the whole day, waiting for death.

B.

Why have you called me, and what do you want?
We crossed the river on the back of the elephant.
On seeing me he began to weep. I was astonished, and asked him the reason of his weeping.

To be translated into English without Dictionary.

यह बात सुनके, राजा ने मंत्री के बेटे को बुलाकर कहा पहले तू तीर्थ यात्रा कर आ; तब उस ब्राह्मणी को तुझे देवेंगे. राजा की बात सुन दीवान के बेट ने कहा महाराज! वह मेरे घर जा बैठे, तो मैं तीर्थ को जाऊं. यह बात सुन, राजा ने उस ब्राह्मणी से कहा, जो तुम पहले उसके घर में जाके रहो तो वह तीर्थयात्रा को जाय. लाचार हो राजा के कहने से, ब्राह्मणी उसके घर में जा रही.

Field Fortification.—Captain Schaw, R.E.

1. What principle governs the slopes given to ramps? What should be the slope of a ramp 10 feet high?
2. The parapet of a field-work is 9 feet high and 18 feet thick, the slopes as usual; draw a section through an embrasure, and a platform for a gun.
3. Give a sketch, with dimensions, showing the disposition you consider most advantageous for fraises in the defence of a field-work.
4. In what cases may stockades be used for the defence of ditches; explain how they should be disposed, and give the dimension of the timbers to be employed.
5. Two heights within range of each other are to be occupied by redoubts, and the valley between them closed; give a sketch of the trace of the works you would throw up for the purpose of effecting the latter, and explain the reason of the trace you adopt.
6. Define the term defilade, and mention the different modes in which a perfect defilade may be secured in the tracing and constuction of field-works.
7. Describe the manner of guarding and defending an ordinary earthern field-work?
8. What are the three methods of attacking field-works, and how may the following obstacles be overcome—abbatis, military pits, palisades?
9. Give a sketch, with dimensions, of a shaft 12 feet deep, with a branch gallery 10 feet long driven horizontally from the bottom of it. Explain how the work is executed, using frames and sheeting. Give an estimate of the men, tools, and materials necessary for forming a shaft and branch in ordinary soil. Calculate the charge necessary to produce a two-lined crater, if lodged at the

extremity of the branch; and explain how you load and prepare the mine for firing without the aid of electricity or Bickford's fuse.

PERMANENT FORTIFICATION.—Captain SCHAW, R.E.

1. Sketch a trace of a front of Vauban's First System, with its outworks; describe the construction, and explain the object of each part of the trace.

2. What modifications did Vauban introduce in his Third System? Explain their advantages and defects.

3. Sketch the trace proposed by Cormontaigne, and explain its construction.

4. Draw a front of the modern French System, showing only the magistral line, and the crest of the parapet in any parts where it is not parallel to the scarp; the glacis and covered way need not be shown. Explain the construction. Scale $\frac{1}{2\,1\,6\,0}$.

5. Draw a section through the centre of the curtain and the tenaille of the French Modern System, and explain how the relief of the latter work is regulated. Scale $\frac{1}{3\,0\,0}$.

6. Find by construction the portions of the ditch of the French Modern System which are undefended, and show them by shading on the drawing required by Question 4.

7. What are the main features of difference between the Modern French System and Vauban's First System. Explain how these differences give increased strength to a place fortified on the former, over one fortified on the latter system.

8. What was the great principle enunciated by Choumara with reference to the tracing of parapets? How did he propose to protect the faces of the bastions from enfilade, and to cover the scarps from an enemy's breaching batteries?

9. Draw a section through a Haxo Casemate, and explain the object of these constructions.

ATTACK.—Captain SCHAW, R.E.

1. What is the object of investing a fortress? Describe briefly how it should be commenced, and how continued.

2. Before commencing the actual operations of a siege, what preliminary work must be performed subsequent to the investment, and for what reasons?

3. State the principles upon which the necessary strength of a besieging army should be calculated, and the data which should govern the proportion of artillery to be used in the attack.

4. How may the quantities of engineer stores and artillery ammunition required for a siege be roughly estimated beforehand?

5. Describe the operation of tracing the first parallel (and its approaches). What is its object?

6. With what objects are the first batteries of the besieger constructed, and where should they be placed to fulfil these objects to the greatest advantage?

7. What are the three sorts of trenches used in a siege? Where should each description be employed, and why? Describe briefly the mode of executing each sort of trench, and state the probable time required for the execution in ordinary soil.

8. Draw a section of a half sunken gun battery, taken through an embrasure, and of a sunken unrevetted mortar battery. Under what circumstances does it become necessary to construct elevated batteries?

9. State briefly the modifications in the system of attack which seem necessary when dealing with a fortification on the polygonal system, armed with rifled guns and rifled small-arms from that laid down for the attack of a fortification on the bastion trace, when 24-pounder smooth-bores and the old-pattern musket were used.

10. What is the object of the forts at Portsdown, and how they are situated with reference to each other, the other works at Portsmouth, and the features

of the ground? Give a sketch showing the general trace of one of these forts, and explain how flank defence is obtained.

Fortification.—By the Professor of the Royal Military Academy.

1. The area of the profile of the parapet of a field-work situated on ground descending towards the front $\frac{1}{6}$ is to be 132 square feet, draw the profile of the ditch, sufficient for supplying the necessary earth, giving it the form you consider in every way most desirable, and explaining your reasons for the slopes of the escarp and counterscarp, and for the width and depth of ditch that you adopt. Excavated earth may be assumed to increase $\frac{1}{10}$ of its bulk by excavation.

Scale $\frac{1}{60}$.

2. Sketch the trace of the field works known by the names of "Redan," "Lunette," and "Double Redan," marking reasonable dimensions for their several parts. Explain the uses to which these works are in general put, their defects, and modes of remedying the latter.

4. A mixed force of regulars and militia, with light and heavy artillery, is available for the defence of a level tract of country between two rivers. The ground is to be fortified by a line with intervals composed of six lunettes, epaulments for artillery, and a polygonal redoubt. Sketch a plan of the position, with the distances marked. State where the artillery of each description would be placed, and also the number and position of the regulars and militia.

4. Irrespective of fords, what parts of a river's course require most carefully guarding against an attempt of an enemy to force a passage. Show how to arrange a bastioned front and lunette so as to oppose such an attempt.

5. Describe the construction of a tambour for flanking a long line of wall, and sketch its profiles according as it is intended to furnish one or two lines of fire.

6. What kind of villages are ill and well adapted for military posts?

7. Under what circumstances may detached works be constructed in front of a fortress? For what reasons is it considered inexpedient to use them for fortresses of minor importance, or defended by badly disciplined troops?

8. Supposing an isthmus to measure 2,400 yards across, show, by a sketch, how you would fortify it by polygonal fronts, the lines of defence being about 400 yards long. What economy, as regards masonry, would result in this case from using a polygonal rather than a bastioned trace with casemated flanks, supposing the exterior sides of the latter to be 600 yards, lines of defence the same as above, two casemated flanks to be equivalent to one caponier, and the front of each provided with a ravelin of the same size.

Fortification.—By the Professor of the Royal Military Academy.

9. Define the following terms, using sketches, if necessary, to elucidate your meaning:—

1. Cunette.
2. Rampart.
3. Fausse-braye.
4. Enceinte.
5. Interior side of polygon.
6. Angle of the flank.
7. Full bastion.
8. Relief.

10. Construct the profile of a permanent work with a covered way from the following conditions:—The ditch is to be 60 feet wide, is to have a counter-arched escarp revetment 30 feet high, and a countersloping counterscarp according to Pasley's rules. The glacis is to slope $\frac{1}{15}$, and to screen a point 3 feet above the top of escarp from an enemy's fire passing through its crest at a slope of $\frac{1}{20}$. The glacis is to be grazed by the artillery fire from the rampart, the terreplein of which is to be defiladed from the enemy's fire, pro-

App. XI.
Royal Military Academy.

ceeding from a point 500 yards from its crest. In consequence of the loose nature of the soil the exterior slope is to be $\frac{3}{4}$. Explain carefully the steps of the construction, and point out any defects that strike you.

Scale $\frac{1}{240}$.

11. A square of 400 yards side is fortified with bastioned fronts. On two adjacent sides the perpendicular and two bastions are each made $\frac{1}{4}$ of the exterior side; on the other faces of the sides the perpendicular is made $\frac{1}{12}$, and the faces of the bastion $\frac{2}{5}$ of the exterior side; point out the defects of each mode of construction, and suggest a better method than either.

12. State the minimum command which any work should have over one in front of it, and how this minimum has been fixed. Describe also on what principles the communications throughout the works composing a fortress should be formed.

13. Draw by hand a profile of the following works used in the polygonal trace; 1st, of one-half of the caponier; 2nd, of the casemated traverse in the ditch of the ravelin and its counterguard, marking both horizontal and vertical dimensions.

14. With what objects did Coehorn divide his bastions and ravelins into two parts, and in what way did he adapt the level of the ditches separating these parts to aquatic sites.

Fortification.—By the Professor of the Royal Military Academy.

15. What is the position, trace, and object of Trench Cavaliers. Draw a section through one, and the ground and works over which its fire passes.

Scale for horizontal dimensions $\frac{1}{240}$
„ vertical „ $\frac{1}{60}$.

16. On the 14th night of a siege, 6 single saps in the 3rd parallel, on the 15th night, 4 single saps in the 3rd parallel, and two circular portions (each 92 yards long), and on the 16th night, 2 single saps in the 3rd parallel and 4 double saps are being executed; give the working parties for each relief of the 15th and 16th nights. The single saps advance at the rate of 72 yards in the 3rd parallel, and 66 yards in the circular portions in 24 hours.

17. Sketch the lodgment by half-double sap on the inner side of the glacis of one of the ravelins attacked. Show clearly the mode of determining the length of each traverse, and convert the proper part of the lodgment into a 5-gun battery for breaching the ravelin.

N.B.—In this and the following question the Modern French System is supposed to be attacked.

18. Describe concisely in general terms the system of works to be carried on after the fall of the salient of the redoubt of the ravelin, and the order in which they occur. State clearly the main object to be effected by each work.

19. Sketch a section and elevation (on a plane parallel to the interior crest) of a blinded battery for one gun, marking all the dimensions. State the object of blinded batteries, and the period of the siege at which they should be executed.

20. Describe how the main ditch is flanked in Coehorn's system; also the advantages and defects of this mode of construction. Sketch the profile of the flanks, marking the dimensions.

21. Describe the construction of Inglis' Iron Shield, and the mode of fixing it.

22. In determining the position and forms of batteries for the defence of harbours, state three important objects to be aimed at. Sketch a section through one of the earthen coast batteries now under construction at Southsea Castle.

Field Works and Bridges.—Captain Schaw, R.E.

1. Detail the parties required for tracing and executing two zigzags of approach, each 100 yards long, by flying sap, and give an estimate of the tools

and materials. Describe the operations, and mention the probable time required for the completion of the work in stiff soil.

2. Describe, with the aid of diagrams, the manner in which the interior slope of a battery should be revetted with fascines. Describe also the revetment you consider best for the cheeks of embrasures.

3. Describe the mode of laying a platform for a 13-inch mortar in soft ground, giving the dimensions of the timbers, and showing their disposition by a sketch.

4. Draw a plan and a rear elevation of an elevated field battery for two guns, constructed on the side of a hill sloping about 20°; the direction of the fire of the guns being to sweep the side of the hill horizontally. Scale $\frac{1}{120}$.

5. In what parts of the courses of rivers do fords usually occur, and for what reasons? Under what conditions are rivers fordable by each arm of the service?

6. How many logs would be required to construct a raft to carry a load of 35 cwt., the timbers available being 10 inches square at one end and 8 inches at the other, and 20 feet long, and the specific gravity of the timber being 700? Describe with the aid of a sketch how the raft would be formed.

7. An arch of a bridge has been destroyed by gunpowder, leaving a chasm of 25 feet wide: give sketches (plan and elevation) of the arrangement you would propose for restoring the communication; telegraph poles, 20 feet long, 8 inches in diameter at the thicker end, and 3 inches at the point being available, with cordage and brushwood.

8. The piers of a floating bridge consist each of eight casks of the following dimensions, length 48 inches, bung diameter 32 inches, end diameter 26 inches, and weight 160 lbs. What weight may be placed on one bay, the platform weighing 1,850 lbs., and allowing one-fourth surplus buoyancy?

Show by diagrams the mode of connecting the casks together to form piers.

Field Works.—By the Professor of Fortification of the Royal Military Academy,

N.B.—In all sketches mark the dimensions.

1. Give the following particulars with regard to the Service Fascine; its length, diameter, size of the brushwood for making it, mode of choking and binding it, and its weight. Sketch also the cradle in which it is made.

2. Sketch the profile of a 2-gun sunken battery, revetted with fascines. Sketch also its tracing lines, supposing it to have an epaulment at one end and extreme ½ merlon at the other, and a traverse between the guns. Show the arrangement of the working party for easy soil, both before and after extension.

3. Sketch the tracing lines of a triangular powder magazine, and show on the diagram the arrangement of the working party at the commencement of the excavation. Mark also the position of the timbers which must be fixed prior to placing the splinter proofs.

4. Under what circumstances is half-double sap employed? Sketch a plan of 40 feet of the head of a sap of this description, supposing it executed by standing sap.

Military Bridges.

1. Explain clearly the advantages and disadvantages of establishing a floating bridge at the bend of a river re-entering with regard to the army.

2. A raft, for the transport of a piece of ordnance, weighing, with its limber, &c., 5 tons, is to be formed of three of Blanshard's large pontoons, placed 7 feet from centre to centre. The baulks, five in number, 3 inches broad, are bolted to the saddles on the two outer pontoons, and rest on that attached to the centre one. The roadway is 10 feet wide, and the chesses and outriggers weigh 65 per foot running of the raft.

Sketch a section of the raft at right angles to the pontoons.

Calculate the depths necessary for the baulks, so that they may be able to support in any position a weight of 3 tons out of the 5, in addition to the weight of the roadway.

What surplus buoyancy will the raft possess?

N.B.—Weight of timber = 47 lbs. per cubic foot.

S = 92

3. The only means available for crossing a river 60 feet wide are some baulks of timber 20 feet long, planks, and about 200 feet of strong rope; explain by sketches how you would construct a suspension bridge from these materials, supposing there are growing on each bank trees to which the suspension ropes may be fastened.

ARTILLERY.—Major C. F. YOUNG, R.A.

First Subject.

1. What is understood by the term "dispart?" State the advantages possessed by a 9-pounder bronze gun with a dispart patch over one without. Give also the reason that Armstrong field-pieces are not provided with these patches.

2. Detail the sights and scales issued with a 32-pounder gun 9 feet 6 inches long, and explain the manner of employing them.

3. In attacking an iron-plated ship, what description of fire should be employed? How will the form of projectile affect the question if the ship have a rolling motion?

4. In breaching a revetment why is it not advisable to use the shells as long as the wall stands?

5. Under what circumstances is it advisable to fire mortars at higher angles than 45°?

6. In carrying on practice in the field how will the inclination of the ground affect the amount of elevation required?

7. If a 68-pounder and a 24-pounder solid shot be fired from their respective guns at the same angle of elevation, on the same plane, so as to have the same initial velocity, which will range the farthest? State the reason.

8. Explain the difference between the terms "Deflection" and "*Derivation.*"

9. State the circumstances under which it is necessary to employ curved fire.

ARTILLERY.—Major C. F. YOUNG, R.A.

Second Subject.

1. In constructing two guns of similar calibre, to be fired with similar charges, &c., the one to be made of cast iron and the other of bronze, is it fair to assume that the thickness of metal at the different parts should be proportional to the tenacities of the two metals? If not, state why.

2. In casting a bronze gun why does it seem desirable to use a chilling mould?

3. What are the rifled ordnance adopted for use in the field service? Give their weights, lengths, and charges.

4. It has been recommended to cast mortars and large iron ordnance on a hollow core. What are the supposed advantages of this mode of casting over that usually employed in this country?

5. If we had confidence in large blocks of steel, why does this material appear particularly adapted to the manufacture of ordnance?

6. Show in section the form of bar used in the Royal Arsenal for making the coils of an Armstrong gun. Explain the reasons of this form being used.

7. When a coil is welded is the tenacity the same in every direction? If not, state how it differs.

8. Describe the water proof of ordnance, and explain its object.

9. Detail the process of cutting the visual lines on a cast-iron gun.

ARTILLERY.—Major C. F. YOUNG, R.A.

Third Subject.

1. Is the ratio between the weights of field guns and their carriages the same for each calibre? If not state how they differ.
2. In considering the effect on the axletree arms of a field carriage upon the gun being fired, what principle should be followed with respect to the construction of the wheels?
3. State the objections to the use of cast-iron for military carriages.
4. Why is it necessary to give an outward inclination to the spokes of a gun-carriage wheel? State the amount of inclination thus given in the Royal Carriage Department.
5. What alterations must be made to a dwarf platform to enable it to be used in a casemate?
6. In order to limit the recoil of an 8-inch gun and carriage (weighing together 78 cwt.) to 5 feet, what must be the inclination of the traversing platform, assuming the following data, viz.; the initial velocity of the shot (weighing 46 lbs.) is 1,400 feet, that of the centre of gravity of the 10 lb. charge of powder is 700 feet, the resistance to the motion of the carriage by friction is two tenths of the normal pressure, and the gun fired parallel to the platform; supposing also there is no escape by windage, and that the gas acts equally on the shot and gun.
7. Describe the wood called Sabicu, and state the purposes for which it is employed in the Royal Carriage Department.
8. Name the different parts of a ship's carriage, and show, with the aid of a sketch, the position of the different bolts, &c.
9. What is the spare carriage for field service? Name the principal articles it is fitted up to carry.

ARTILLERY.—Major C. F. YOUNG, R.A.

Extra Subject.

1. Give the formulæ for finding the terminal velocities of balls, and deduce from them the terminal velocities of an 8-inch solid and also an 8-inch hollow shot?
2. In order to give rotation to an elongated shot does it seem desirable that the grooves of the gun should be shallow or deep—broad or narrow. What are the considerations bearing on the question?
3. Explain how the form of the hinder part of a projectile will influence its retardation in its passage through the atmosphere at a high velocity?
4. In making an experiment with Navez' Electro Ballistic apparatus, is the arc through which the index needle moves a measure of the time the shot takes in its passage between the screens? If not state the necessary correction.

ARTILLERY.—By the PROFESSOR of ARTILLERY at the ROYAL MILITARY ACADEMY.

Gunnery.

1. Show why the trajectory of a shot fired in vacuo would be a parabola. With what velocities may the parabolic theory be usefully employed in practice?
2. How may the velocity of a shot be determined by the gun pendulum? Will the velocity so obtained be greater or less than that found by the ballistic pendulum?
3. Up to what velocity, according to Hutton's experiments, is there a gradual increase in the ratio of the resistance of the air to the velocity of a ball discharged from a gun? How may this increase in the ratio be accounted for?
4. The initial velocity of the shot of a 12-pr. Armstrong gun being 1,184 feet per second, what would be the velocity of a cylinder twice the weight of

App. XI.
Royal Military Academy.

the shot fired with the service charge? Find also the velocity of recoil of the gun in each case.

5. Upon what general principles does the determination of the velocity of a shot by means of the ballistic pendulum depend? If a 32 lb. shot be fired at a ballistic pendulum the block of which weighs 90 cwt., what will be its velocity on striking, supposing the velocity of the block with the shot in it to be 5 feet per second?

6. Why may reduced charges be frequently used with advantage in firing at wooden ships? If a 32 lb. shot moving at the rate of 500 feet a second penetrates into timber to a depth of 3 feet, what would be the penetration into the same material of a 68-pr. shot having a velocity of 600 feet?

7. What advantages would be probably gained by placing the vent of a gun in the axis at the bottom of the bore? In what respect would such a position be objectionable?

8. If an eccentric shot be fired from a smooth-bored gun, how will its flight be influenced by the position of the centre of gravity with regard to the centre of figure when the shot was in the bore?

9. Show by a diagram the direction of the forces which act upon an elongated shot when fired from a gun. Find the velocity of rotation of the Enfield bullet on leaving the bore; initial velocity 1,272 feet per second; twist of grooves 1 turn in 6 ft. 6 in.

ARTILLERY.—By the PROFESSOR of ARTILLERY at the ROYAL MILITARY ACADEMY.

Gunnery.

1. What is the meaning of the term *angular velocity?* Find the velocity of the centre of oscillation of a vibrating pendulum, the angle of semi-vibration being 15°, and the distance from the axis of suspension 12 feet.

2. Describe the construction of the disjunctor of Navez' electro-ballistic apparatus, and explain why the disjunctor is required.

3. If a shot fired from the service 40-pr. rifled gun strikes an object 400 yds. distant, what is the velocity on impact; initial velocity 1,164 feet per second, diameter of shot 4·75 inches?

4. Find the terminal velocity of an 8-inch shell, weighing filled about 49 lbs.

ARTILLERY.—By the PROFESSOR of ARTILLERY at the ROYAL MILITARY ACADEMY.

Ammunition for Ordnance.

What are the special purposes for which round shot, shrapnel shells, and common shells are respectively adapted in land service?

2. Describe the furnace used for melting the iron for casting into shot in the Royal Laboratory. What parts of a shell are most liable to unsoundness, and how are shells tested to detect imperfections in the metal?

3. Explain the construction of a tier grape shot; up to what range is it effective? How is the Armstrong segment shell fired when it is intended to act as a case shot, and what is the great objection to firing shells at very short ranges.

4. What is the essential principle of a shrapnel shell? Are any advantages gained by firing elongated projectiles (from rifled guns), as shrapnel shells, and is there any circumstance attending the flight of such projectiles which is injurious as regards the effect of the shell?

5. What compositions are respectively used for the core and the inner core of a 40-pr. segment shell? Why is the former made with a number of rings round it?

6. Name the different operations in "leading" an Armstrong segment shell. Why is the zinc not allowed to pass into the shell?

7. Why is a percussion arrangement required in the time fuze for the Armstrong breech-loading gun? Upon what mechanical law does the ignition of the pellet in this fuze depend?

8. Calculate the length of a cartridge for the 12-pr. Armstrong rifled gun. Calibre, 3 inches; weight of a cubic inch of powder, ·03 lbs.

9. Describe, with the aid of a sketch, the metal friction tube.

Artillery.—By the Professor of Artillery at the Royal Military Academy.

Ammunition for Small Arms. Rockets. Compositions.

1. What is shellac; also, methylated spirit? For what purposes are they respectively used in the Royal Laboratory, and for what liquid has the latter been substituted?

2. Describe the different methods of "mealing" gunpowder. What is the size of the mesh through which meal powder is passed?

3. Explain the principle of the Whitworth and Lancaster rifles.

4. What substance is used for lubricating small-arm cartridges, and why is the lubrication necessary? How is the adhesion of the paper to the bullet during flight prevented?

5. How are percussion caps for land and naval service respectively packed?

6. Of what alloy are the bullets for diaphragm shells made, and why is pure lead not used? How are they manufactured?

7. Sketch a section through the longer axis of a Congreve rocket, and explain the object of driving the composition of the rocket over a spindle.

8. How is the stick attached to the signal and Congreve rockets respectively? Why is a stick required for both these rockets, but not necessary for a rocket of Hale's construction?

9. How does the force which impels a rocket differ from that which projects a shot from a gun? What kind of motion is produced in each case?

Surveying.—Lieut.-Col. Scott, R.E.

Morning Paper.

1. State briefly and clearly the advantages gained by basing a survey of a tract of country on a triangulation.

2. Draw a diagram illustrative of the arrangement which you would as far as possible adopt for the network formed by a triangulation, specifying the order in which you would calculate the triangles shown, and the side which you would by preference, for the sake of accuracy, first lay down on paper.

3. Explain why, when it is impossible to place the theodolite at the centre of a trigonometrical station, you should choose an observing point, or satellite station, as near the centre of the station-mark as circumstances admit.

4. Draw a diagram showing the conditions under which, with a given distance between the observing or satellite station and the centre of the trigonometrical station-mark, the value of the correction for the "Reduction to the centre" will be a maximum, and when a minimum.

5. Explain clearly the advantages of referring all angular measurements made in running a traverse to the same meridian or zero line.

6. Explain the manner in which accuracy is obtained in traversing.

First. As respects the connection between the traverses and the trigonometrical points in commencing and closing the former.

Secondly. As respects checking the angular work while still in the field.

Thirdly. As respects checking both the angular and linear measurements in protracting the traverses.

7. Give an imaginary example of the entries which should be made in the Field Book when commencing a traverse at a station not admitting of the theodolite being placed over its centre.

8. Describe the simplest method you are acquainted with for finding the distance of an inaccessible point without angular measurement.

App. XI.

Royal Military Academy.

SURVEYING.—Lieut.-Col. SCOTT, R.E.

Afternoon Paper.

9. Find the difference of altitude between two points, A and B, under the following circumstances:

At A the barometric column stood at 30 inches; the temperature of the column was 60° Fahr.; the temperate of the air was 63° Fahr.

At B the barometric column stood at 28 inches; the temperature of the column was 53°; the temperature of the air was 52°.

[N.B.—Logarithm tables and tables of corrections allowed for the first half hour only.]

10. Explain how to find the distance of an inaccessible point by employing a box sextant and a table of tangents.

11. What are the adjustments to be examined before proceeding to ascertain or correct the index error of a sextant?

12. Explain the advantages of a prismatic compass over a box sextant for surveying a line of road by a process of traversing.

13. In ascertaining the error of a chronometer by a single altitude, why is it necessary to have an approximate knowledge of the longitude? What are the other data which are essential to the solution of the problem?

14. What points of the diurnal path of a heavenly body would you consider most favourable for determining the chief element in the above problem, which is dependent on your own observation.

Extras.

15. Explain the processes which take place, both in and on each of the bulbs of a Daniell's hygrometer, when the instrument is in use.

16. What are the atmospheric conditions under which the indications of Daniell's hygrometer are least to be relied on?

17. What is meant by clearing the lunar distance? Specify all the data which are necessary for clearing it under the simplest conditions, explaining how they enter into the problem.

SURVEYING.—By the PROFESSOR of SURVEYING at the ROYAL MILITARY ACADEMY.

1. Explain the meaning of the term "Trigonometrical Surveying," and state the general order of the steps followed in carrying it out.

2. State the points requiring particular attention in the selection and measurement of a base line, and give the reasons for this great care.

3. Suppose that, after a base has been measured, it is found necessary to extend it in one direction, where some difficult ground occurs; how can a point be found in continuation of the base, and its distance correctly ascertained? Show with diagram.

4. Explain, with diagrams, the process of ascertaining and adjusting any error in the line of collimation of a Theodolite Telescope, taking every precaution to ensure a correct focus.

5. Show how the small plate levels are adjusted, and explain the advantage of having them thus correct.

6. State the general difference between the adjustments of the Theodolite and the Y spirit level, and describe the mode of collimating a Dumpy-level.

7. A point, ten feet below the top of a spire on a headland, is just visible from a station 40 miles distant, across an estuary, and 300 feet above the sea level; what is the height of the top of the spire above the same level? Curvature and refraction being taken at the average value.

8. The horizontal distance of A from B is 20,000 feet; A is a tower 40 feet high, on which the Theodolite is placed; and B the top of a steeple 250 feet high. An angle of elevation of 2° 40′ was taken from A to B. What is the relative altitude of the ground at A and B, omitting refraction?

9. Show, with diagram, how the amount of refraction may be ascertained, by observing the apparent angle of depression of the sea's surface.

Extra.

10. State the mode of dividing the scales of the three thermometers in general use, and convert 60° of Reaumur and Centigrade to their equivalent value on Fahrenheit's scale.

11. Describe a simple form of wind-gauge, and explain the means of testing the accuracy of such an instrument.

12. Explain, with diagram, the principle of the construction of the sextant, showing how the true angle is registered by the index.

SURVEYING.—By the PROFESSOR of SURVEYING at the ROYAL MILITARY ACADEMY.

13. Explain the meaning of the term "Parallax of the sextant," showing, with a diagram, the reason for using a distant, rather than a near, object in adjusting that instrument.

14. What effect will be produced in the box sextant by incorrect adjustment of the glasses—1st, as to parallelism, 2nd, perpendicularity to the plane of the instrument?

15. A B is a tower on the opposite side of a swamp. At P an angle of 45° is taken to the top of the tower, and at R 300 feet further along A P, an angle of 18° 26′ is observed. Find the height of the tower.

16. Explain the mode of traversing along a road with the prismatic compass, pointing out the most expeditious way of taking the angles.

17. On what general principle does the action of the Barometer depend? How is this applied to the measurement of heights, and what disturbing forces must be taken into account?

18. The meridian double altitude of the sun's lower limb, on 12th May 1858, was found to be 84° 30′; semi-diameter, 15′ 51·5″; refraction at 45°, 58·1″; difference for 1° altitude ·204″; declination, 18° 7′ 9·5″. Find the latitude.

Extra.

19. Explain the meaning of the term circum-polar stars, and show, with diagram, how such stars may be used to determine the latitude, without knowing the declination.

20. Explain the method of ascertaining the latitude by "two observed altitudes and the interval between them," or by placing a transit instrument in the plane of the prime vertical.

NATURAL PHILOSOPHY.—By the PROFESSOR of MECHANICS and NATURAL PHILOSOPHY at the ROYAL MILITARY ACADEMY.

1. What do you understand by "induced electricity?" Illustrate your meaning by referring to experiments, and explain the "Electrophorus."

2. How is it shown that pointed bodies are powerful dissipators of an electric charge? Describe an experiment which proves that a body may be charged positively by withdrawing its negative electricity, and hence explain the electrical machine.

3. Write down the following substances in their order as being electro-positive or electro-negative, with reference to each other; viz. Carbon, Sulphur, Iron, Oxygen, Copper, Sodium, Zinc, Hydrogen. By what arrangement can you demonstrate that an electric current may be set up between plates coated with oxygen and hydrogen respectively? Hence explain Grove's Battery.

4. In what way are permanent magnets made? A bar of iron in the form of a horse-shoe, some copper wire coated with cotton, and a Smee's battery being provided, show how to make an electro-magnet, and point out the respective poles under the conditions which you assume with reference to the coiling of the wire, and the connexions with the zinc and silver plates of the battery.

5. What apparatus did Mr. Faraday first employ in order to obtain an electric spark by the direct action of a piece of loadstone.

6. Explain the "Induction Coil," and the method of experimenting with it. Mention some facts which illustrate the electrical principles involved in the arrangement of the instrument.

7. State the law of the refraction of light. How is the refraction of light explained on the undulatory theory? When is light totally reflected at the internal surface of a transparent medium? Explain the Camera-Lucida.

8. Describe Newton's experiment for showing the dispersion of a beam of sunlight by a prism; account for the possibility of bending such a beam by a compound prism without producing any sensible dispersion.

9. Explain the formation of an image by a concave spherical mirror, find its position by a geometrical construction, and show where the object must be placed in order that the mirror may produce: (1) a magnified and real or virtual image; (2) a diminished and real image of it.

Applied Chemistry.—By the Lecturer in Chemistry at the Royal Military Academy.

1. Give a brief explanation, from a purely chemical point of view, of the principles involved in the extraction of Iron from Clay Ironstone, and in the subsequent conversion of the Cast Iron into Bar Iron and Steel.

2. What is the difference between Cast Steel and Puddled Steel, and which of the two possesses the valuable qualities of Steel in the highest perfection?

3. Define the nature and object of the process of *roasting* in Metallurgic Operations. Describe the effect of this process upon Copper Pyrites, and state how the extraction of the Copper is facilitated by the operation.

4. Will Galvanized Iron or Tin Plate endure best under ordinary atmospheric conditions—and why?

5. Give a chemical account of the preparation of Charcoal for Gunpowder. Under what circumstances could the Charcoal be made to approach very nearly, in composition, to pure Carbon? Would this be advantageous for the manufacture of Gunpowder?

6. What would be the effect of omitting the Sulphur in the manufacture of Gunpowder? Give the reasons.

7. Describe the process of testing Nitre to ascertain its fitness for the manufacture of Gunpowder. What particular impurity would lead to its rejection?

8. By what processes of testing with the blowpipe could you recognise the presence of Copper, Arsenic, and Cobalt in an ore? Describe the indications.

9. Describe the Chemical Analysis of Brass.

10. Name the constituents of the substance here described. A black powder, partly dissolved by boiling water, leaving a black residue. This residue, heated on charcoal, with carbonate of soda, before the blowpipe, gave a brittle metal and a white incrustation. Another portion of the residue, boiled with hydrochloric acid, dissolved entirely, evolving hydrosulphuric acid.

The solution in water, originally filtered from the black residue, when evaporated, deposited tabular crystals which coloured the blowpipe flame violet, and detonated when heated with strong sulphuric acid.

Do you know of any use for this composition?

Chemistry.—Professor Liveing.

1. State the constitution of clay ironstone, magnetic ironstone, red and brown hæmatite, vivianite, and iron pyrite. What effects have the two last-named minerals respectively upon the quality of the iron produced from ores with which they are mixed?

2. Explain the principles which would guide you in selecting a flux for any given ore of iron. How is the working of a blast furnace affected by the presence of too much or too little lime?

3. What are *natural* steel and *case-hardened* iron? Describe and explain how the latter is produced.

4. State the chemical constitution of tinstone. With what other minerals is it usually associated in nature? Describe the process of washing tinstone, and the effects of this treatment.

5. Give an account of the process of reducing zinc from blende, explaining the chemistry of each stage. What are the most common impurities in commercial zinc, and by what tests may they severally be detected?

6. What are bronze, fusible metal, muntz metal, and soft solder? If you were required to demonstrate the presence of each of the metals in muntz metal, explain how you would proceed, stating the chemical actions which occur in the process, in the form of equations.

7. What effect has an admixture of silver on the qualities of lead? Describe a process for refining argentiferous lead. Mention any processes analogous in principle to this which are used for refining other substances.

8. State the chemical constitution of wood. How does wood of many years' growth differ from young wood? What chemical changes are effected by carbonisation? What qualities are required in the charcoal which is to be used for gunpowder?

9. Explain how nitre may be made from nitrate of soda. What effect has common salt upon nitre which renders it unfit for gunpowder? Explain how the presence of common salt and of sulphate of potash in nitre may be detected.

10. Explain how the proportion of the ingredients to be employed in making gunpowder may be determined theoretically.

11. A certain substance when examined on charcoal with the blow-pipe gave an incrustation which was yellow while hot and white when cold, and left a black residue, which, when heated with borax, gave in the outer flame a bead which was yellow while hot and greenish when cold, and in the inner flame a bead which was green when cold; what metals do you infer to have been present?

12. A certain mineral when strongly heated on charcoal in the reducing flame yielded a bright white metal bead which became dim as soon as removed from the flame; the bead was malleable, and when treated with nitric acid left a white substance, insoluble in water or nitric acid, but soluble in potash; state the mineral which you would suppose from these reactions was employed, and explain the chemistry of these reactions.

13. Given a salt of sodium and one of potassium; state how they may be distinguished, and also how the two metals may be detected in a mixture of the two salts. Explain the principle of your method.

MECHANICS.—By the PROFESSOR of PRACTICAL MECHANICS.

1. What are the average tensile strengths of cast and malleable iron? Draw in section a useful form of girder beam to be made from boiler-plate iron, and show how to fasten the plates together. Describe the method of construction adopted in forming the main girders of the Charing Cross bridge. Why do struts and ties alternate in regular succession? Account for the differences in the distribution of the metal as you pass along the beam.

2. Select and explain any examples which you have observed in the machinery at the Arsenal, and which illustrate some of the various movements to be obtained by the use of cams.

3. Describe the arrangement of three pulleys and three bevil wheels for producing a reversing motion in the rifling machine; describe also some contrivance for obtaining a reversing motion with a quick return.

4. Enumerate the principal parts of a double-acting condensing steam-engine, and point out very briefly the uses which they severally fulfil.

5. Explain the eccentric for working the slide-valve of a steam-engine; draw the locomotive D slide-valve, and the ports for the passage of the steam, giving at the same time a description of your drawing.

App. XI.

Royal Military Academy.

6. What is the construction of the indicator? How may it be used for the purpose of ascertaining the actual horse-power of a steam engine. Draw an indicator diagram of the character which you would expect to take from a condensing steam-engine, and show that the peculiarities in the form of the curve exhibit completely the working of the engine.

7. Give a sketch of the mode of constructing a railroad, and of laying down the rails for traffic. Analyse and explain Stephenson's invention of the Locomotive Engine and Boiler.

Geology and Mineralogy.—S. P. Woodward, F.G.S.

1. Give some account of the geological formations which occur in the valley of the Thames, more particularly in the vicinity of Woolwich.

2. Draw an ideal section showing how the outcrop of a stratum at the surface may be occasioned by the inclination of the beds, or by the slope of the ground, or by a fault.

3. Is the mineral character of either the Plutonic or Sedimentary rocks constant and similar in distant parts of the globe?

4. Explain the theory of the identification of strata by fossils.

5. State the minerals composing the following rocks, and the class to which each belongs :—Porphyry, Serpentine, Dolomite, Travertine.

6. What are the building materials and road stones usually employed in the regions of Plutonic and Metamorphic rocks; those of the Secondary districts, and those of the Tertiary.

7. What effects have the presence of phosphorus and sulphur on the quality of iron?

8. Enumerate the principal minerals known as "precious stones," and give their essential composition and hardness.

9. Explain the difference between the Cleavage, Fracture, and Frangibility of a mineral? Give examples of minerals exhibiting distinct Cleavage, chatacteristic Fracture, and easy or difficult Frangibility.

10. Specify any minerals which are essentially hydrated silicates of alumina and others which are anhydrous.

11. Draw the simplest or ordinary crystalline forms of Iron-pyrites, Spinel, Garnet, Tourmaline.

12. Describe the results produced by fusing Manganese, Cobalt, and Iron, with borax, by means of the blowpipe.

Mineralogy and Geology.—By the Lecturer in Geology at the Royal Military Academy.

1. How many mineral species are described by modern writers on Mineralogy? what proportion of these are said to be found in the British Isles and in the various Colonies connected with Great Britain?

2. Enumerate the Physical characters of Minerals; and particularize those characters most important in their identification.

3. What is the specific gravity of a mineral, the weight of which in air is 222 grains, and in water 159 grains?

4. What crystalline forms can be obtained by cleavage from Blende, Calcite, Fluor-spar, Galena, and Rock-salt?

5. Explain the difference between Breccia, Conglomerate, Stalactite, and Stalagmite, and describe how each is formed.

6. What are the characters by which you can distinguish in ores the presence of Arsenic, Cobalt, Iron, Lead, Manganese, and Mercury, before the blowpipe?

7. Make sketches of the most common crystalline forms of Beryl, Diamond, Iron-pyrites, Quartz, Sapphire, and Topaz; mark the striæ and cleavage of each.

8. Make a list of the stratified fossiliferous rocks found in the British Isles, and give the names of some of the most important of their fossils.

9. Name the most important minerals found in the Carboniferous Rocks of this country, and give their annual value.

10. Give a sketch of each of the following genera—Ammonite, Baculite, Belemnite, Ceratite, Goniatite, Hamite, Nautilus, Pentamerus, Producta, Orthoceratite, and Scaphite; also Nummulite, Tribolite, and Graptolite; and illustrate by diagram their distribution in Geological time.

11. How would you proceed to examine a foreign country; and in what way would you record your observations, and mark your specimens, in order to render them useful to more experienced geologists at home?

Name the Minerals, Rocks, and Fossils on the accompanying tray; give the crystalline form of the specimens numbered 1, 3, 4, and 7; mention the Strata to which the Fossils numbered 2, 9, 11, and 15 belong, and classify the Rocks numbered 6, 13, 16, 19, and 20 into Aqueous, Metamorphic, Plutonic, and Volcanic.

Appendix XII.

Analysis of the Marks gained by Candidates for Admission to the Royal Military College, Sandhurst, in the four Examinations held in the Years 1862–3.

Mathematics (Obligatory) - { Maximum - - 1,200 / Minimum - - 400 }

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
Under 0 to 100 -	0	1	3	0	4	·8
100 „ 200 -	2	1	3	1	7	1·4
200 „ 300 -	6	1	3	1	11	2·1
300 „ 400 -	6	2	2	1	11	2·1
400 „ 500 -	16	7	14	4	41	7·7
500 „ 600 -	16	13	3	7	39	7·3
600 „ 700 -	10	12	15	15	52	9·8
700 „ 800 -	15	14	23	8	60	11·3
800 „ 900 -	14	19	23	17	73	13·7
900 „ 1,000 -	14	26	26	25	91	17·1
1,000 „ 1,100 -	12	20	21	35	88	16·5
1,100 „ 1,200 -	5	12	20	17	54	10·1
1,200 - -	1	0	0	0	1	0·1
Total -	117	128	156	131	532	100

App. XII.

Royal Military College.

Mathematics (Voluntary) - { Maximum - - 2,400 / Minimum - - 0

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
Under 0 to 100 -	9	36	19	15	79	21·4
100 „ 200 -	14	20	22	21	77	20·7
200 „ 300 -	15	11	16	12	54	14·5
300 „ 400 -	5	4	8	6	23	6·3
400 „ 500 -	3	1	4	5	13	3·6
500 „ 600 -	3	1	9	4	17	4·6
600 „ 700 -	3	6	2	3	14	3·8
700 „ 800 -	5	3	5	1	14	3·8
800 „ 900 -	3	1	3	4	11	3·0
900 „ 1,000 -	0	6	4	1	11	3·0
1,000 „ 1,100 -	0	1	4	2	7	1·9
1,100 „ 1,200 -	1	4	3	3	11	3·0
1,200 „ 1,300 -	0	1	6	1	8	2·2
1,300 „ 1,400 -	0	1	2	—	3	0·8
1,400 „ 1,500 -	0	3	2	2	7	1·9
1,500 „ 1,600 -	0	0	0	4	4	1·1
1,600 „ 1,700 -	0	0	3	1	4	1·1
1,700 „ 1,800 -	0	0	1	3	4	1·1
1,800 „ 1,900 -	0	0	0	1	1	0·3
1,900 „ 2,000 -	0	0	0	0	0	—
2,000 „ 2,100 -	0	0	1	2	3	0·8
2,100 „ 2,200 -	0	0	0	4	4	1·1
Above 2,200 -	0	0	0	0	0	—
Total -	61	99	114	95	369	100

English - - - { Maximum - - 1,200 / Minimum - - 200

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 -	0	0	2	0	2	·4
100 „ 200 -	6	7	4	4	21	4·0
200 „ 300 -	22	36	41	35	134	25·1
300 „ 400 -	37	29	32	23	121	22·7
400 „ 500 -	30	31	39	36	136	25·5
500 „ 600 -	10	22	25	22	79	14·8
600 „ 700 -	11	3	7	8	29	5·5
700 „ 800 -	1	0	4	2	7	1·4
800 „ 900 -	0	0	2	0	2	0·4
900 „ 1,000 -	0	0	0	0	0	—
1,000 „ 1,100 -	0	0	0	1	1	0·2
1,100 „ 1,200 -	0	0	0	0	0	0
Total -	117	128	156	131	532	100

History - - - { Maximum - - 1,200
Minimum - - 200

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 -	13	6	17	14	50	9·6
100 „ 200 -	11	7	12	11	41	7·9
200 „ 300 -	36	33	45	33	147	28·2
300 „ 400 -	21	31	35	28	115	22·1
400 „ 500 -	16	20	18	19	73	14·0
500 „ 600 -	5	16	11	7	39	7·5
600 „ 700 -	7	9	9	4	29	5·6
700 „ 800 -	4	4	6	5	19	3·7
800 „ 900 -	0	1	1	1	3	0·6
900 „ 1,000 -	0	0	0	1	1	0·2
1,000 „ 1,100 -	0	0	1	0	1	0·2
1,100 „ 1,200 -	0	0	0	1	1	0·2
1,200 - -	0	0	1	0	1	0·2
Total -	113	127	156	124	520	100·

Latin - - - { Maximum - - 2,000
Minimum - - 333

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 -	9	8	1	1	19	5·4
100 „ 200 -	11	11	8	8	38	10·8
200 „ 300 -	5	4	15	16	40	11·3
300 „ 400 -	21	13	26	15	75	21·2
400 „ 500 -	7	2	12	11	32	9·1
500 „ 600 -	7	9	12	10	38	10·8
600 „ 700 -	6	10	9	6	31	8·8
700 „ 800 -	4	2	6	7	19	5·4
800 „ 900 -	0	5	5	2	12	3·4
900 „ 1,000 -	5	4	5	2	16	4·5
1,000 „ 1,100 -	0	6	4	7	17	4·7
1,100 „ 1,200 -	1	3	2	3	9	2·5
1,200 „ 1,300 -	2	1	—	2	5	1·4
1,300 „ 1,400 -	0	0	1	0	1	0·2
1,400 „ 1,500 -	0	2	0	0	2	0·5
Above 1,500 -	0	0	0	0	0	—
Total -	78	80	106	90	354	100

Greek - - - - { Maximum - - 1,600
Minimum - - 266

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 -	1	4	10	5	20	17·0
100 „ 200 -	1	3	3	7	14	11·8
200 „ 300 -	3	6	9	6	24	20·4
300 „ 400 -	5	3	6	1	15	12·7
400 „ 500 -	3	3	4	3	13	11·1
500 „ 600 -	2	2	3	4	11	9·3
600 „ 700 -	1	2	—	4	7	6·0
700 „ 800 -	1	1	3	3	8	6·7
800 „ 900 -	—	1	—	1	2	1·7
900 „ 1,000 -	—	—	1	—	1	0·8
1,000 „ 1,100 -	—	—	—	2	2	1·7
1,100 „ 1,200 -	—	—	—	1	1	0·8
Above 1,200 -	0	0	0	0	0	—
Total -	17	25	39	37	118	100

French - - - { Maximum - - 1,200
Minimum - - 200

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 -	16	11	4	7	38	7·6
100 „ 200 -	5	4	7	12	28	5·6
200 „ 300 -	26	18	20	19	83	16·5
300 „ 400 -	12	11	26	25	74	14·7
400 „ 500 -	11	12	28	17	68	13·5
500 „ 600 -	12	12	23	11	58	11·5
600 „ 700 -	7	10	18	12	47	9·3
700 „ 800 -	4	14	9	13	40	8·0
800 „ 900 -	4	11	12	3	30	6·0
900 „ 1,000 -	4	13	5	3	25	4·9
1,000 „ 1,100 -	1	8	1	2	12	2·4
Above 1,100 -	0	0	0	0	0	—
Total -	102	124	153	124	503	100

German - - - - { Maximum - - 1,200 / Minimum - - 200

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 -	2	2	0	1	5	4·7
100 „ 200 -	4	1	2	1	8	7·5
200 „ 300 -	3	4	3	3	13	12·1
300 „ 400 -	1	4	11	3	19	17·8
400 „ 500 -	4	2	5	5	16	14·9
500 „ 600 -	1	3	3	5	12	11·2
600 „ 700 -	2	5	2	2	11	10·3
700 „ 800 -	3	3	2	4	12	11·2
800 „ 900 -	1	—	4	—	5	4·7
900 „ 1,000 -	—	—	2	1	3	2·8
1,000 „ 1,100 -	—	—	—	2	2	1·9
1,100 „ 1,200 -	—	—	—	1	1	0·9
Total -	21	24	34	28	107	100

Natural Sciences - - { Maximum - - 1,200 / Minimum - - 200

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 -	2	—	1	5	8	15·2
100 „ 200 -	2	2	1	7	12	22·7
200 „ 300 -	3	—	3	3	9	17·0
300 „ 400 -	1	3	4	3	11	20·8
400 „ 500 -	—	1	1	1	3	5·6
500 „ 600 -	—	—	4	1	5	9·4
600 „ 700 -	—	1	2	—	3	5·6
700 „ 800 -	—	—	1	1	2	3·7
Above 800 -	0	0	0	0	0	—
Total -	8	7	17	21	53	100

Experimental Sciences - { Maximum - - 1,200 / Minimum - - 200

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 -	1	5	4	4	14	11·3
100 „ 200 -	2	1	5	2	10	8·1
200 „ 300 -	1	4	2	—	7	5·7
300 „ 400 -	1	4	3	5	13	10·6
400 „ 500 -	6	7	5	2	20	16·3
500 „ 600 -	2	2	8	4	16	13·0
600 „ 700 -	3	2	2	4	11	9·0
700 „ 800 -	1	1	5	2	9	7·3
800 „ 900 -	2	—	1	5	8	6·5
900 „ 1,000 -	2	2	2	3	9	7·3
1,000 „ 1,100 -	1	2	2	1	6	4·9
Above 1,100 -	0	0	0	0	0	—
Total -	22	30	39	32	123	100

Geometrical Drawing - { Maximum - - 600 / Minimum - - 100

No. of Marks.	No. of Candidates.				No. per Cent.
	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 - -	35	62	45	142	49·5
100 „ 200 - -	35	45	31	111	38·7
200 „ 300 - -	13	8	8	29	10·1
300 „ 400 - -	1	1	2	4	1·4
400 „ 500 - -	1	0	0	1	0·3
500 „ 600 - -	0	0	0	0	—
Total -	85	116	86	287	100

Free Hand Drawing - { Maximum - - 600 / Minimum - - 100

No. of Marks.	No. of Candidates.					No. per Cent.
	June 1862.	December 1862.	June 1863.	December 1863.	Total.	
0 to 100 -	29	24	45	36	134	41·3
100 „ 200 -	42	26	44	34	146	44·9
200 „ 300 -	12	6	6	4	28	8·6
300 „ 400 -	4	1	3	3	11	3·4
400 „ 500 -	1	2	1	1	5	1·5
500 „ 600 -	—	1	—	—	1	0·3
Total -	88	60	99	78	325	100

Appendix XIII.

Synopsis of the present Course of Instruction at the Royal Military College, Sandhurst.

Mathematics.

Obligatory Course.

1st Section:

Arithmetic.—Vulgar and decimal fractions, compound rules, aliquot parts, square root, proportion, interest, and partnership.

Algebra.—First four rules, square root, greatest common measure, and least common multiple, fractions, simple equations and questions producing them, surds, quadratic equations and questions producing them.

Euclid.—Six Books; the fifth treated algebraically, and the following propositions omitted:—in Book II., props. 8, 9, 10; in Book III., prop. 8; and in Book VI., props. 7, 27–30.

Voluntary Course.

2nd Section:

Algebra.—Arithmetical and geometrical progressions, the use of logarithmic tables, with their application to multiplication, division, involution, evolution, and compound interest. Simple expansions by the binomial theorem.

Plane Trigonometry.—The elementary definitions and formulæ so far as to lead to the solution of triangles, and the mensuration of heights and distances.

Mensuration.—Triangles, quadrilaterals, circles, regular polygons, Simpson's method of approximation to an irregular area, cylinders, prisms, pyramids, cones, spheres, and spherical shells.

3rd Section:

Statics.—Composition and resolution of forces, parallelogram of forces, forces acting on a point in one plane, principle of the lever, parallel forces, principle of moments, centre of gravity, mechanical powers, laws of friction, principle of work, limiting angle of resistance, friction on the inclined plane, wedge, screw, and on an axle, equilibrium of walls, thrust of props and roofs, tension of a tie-beam.

Dynamics.—Laws of motion.—Free and constrained rectilinear motion under a constant force, with especial reference to gravity.

Projectiles.—Impact.—Accumulation of work in a falling body.

Hydrostatics.—Specific gravity, pressure and equilibrium of fluids, floatation, Boyle's law, the principal hydrostatical instruments.

Syllabus of the First and Second Course of Fortification.

Practical Operations performed by the cadets, in their course of Fortification; time and weather permitting.

(N.B.—This part of the instruction goes hand-in-hand with the in-door instruction, as far as is possible; thus, when a cadet first learns what a parapet is, he is taught to trace a simple one on the ground, and to set up a profile of it; and similarly for every part of the course.)

Practical Geometry.

1. To bisect a line.
2. To bisect an angle.
3. To trace perpendiculars to lines, from points either in the lines, or on either side, near the middle or the ends of the lines.
4. To construct an angle equal to one given.
5. To construct a line parallel to a given line.
6. To construct regular pentagons, hexagons, or octagons.
7. To draw a tangent to a circle.

The above problems are sufficient to enable any ordinary works to be traced accurately on the ground, either in outline or detail.

Field Fortification.

The following works are traced, and profiled in the order mentioned:—

A straight line of intrenchment. A redan.

A lunette; redoubts of different shapes; star forts; bastioned fronts; and simple bridge heads.

In every case (where possible) advantage is taken of irregularity in the shape of the ground, to avoid defects, and strengthen the work.

The following problems on Defilade are performed on the ground:—

To find the proper height for a line of intrenchment commanded in front; also for a redan or lunette.

To defilade a closed work, by means of a parados, from commanding ground on one side.

Existing military obstacles are visited, including palisades, fraises, trous-de-loup, chevaux de frise, abattis.

Pontoon bridges are put together, and manœuvred in the presence of the cadets; and piers of casks formed.

Existing works, including two redoubts and a bastioned fort, are visited, and the uses of the various details explained, such as embrasures and barbettes, traverses of different kinds, platforms, magazines; caponnières, and counter-scrap galleries for flanking ditches; obstacles above mentioned, &c., &c.

Works carried on in the presence of the Cadets by the Engineer Corps.

Flying sap. Single and double full sap. Expense magazines. Siege batteries. Laying platforms. Construction of 1st parallel and approaches by simple trenching. Manner of carrying up two gabions and intrenching tools by each man. Iron hoop gabion put together. Fascine cradle. During the spring term, the cadets themselves make fascines and gabions.

Practical Geometry and Scales.

Use of instruments. Protractor. Marquois scales.

Principle of construction of the latter.

Rules for drawing with pencil, and for tinting.

1. To bisect a line.
2. To bisect an angle.
3. To draw a perpendicular to a line (from a point in or on either side of it). The same when the perpendicular is to be very near the extremity of the line.
4. To draw a line parallel to another.
5. To construct an angle equal to one given.
6. To make a triangle or polygon similar to one given.
7. To divide a line into a given number of equal parts.
8. To reduce a polygon to a triangle of equal area.
9. To draw a circle through three points not in a straight line.
10. To construct a regular polygon by its angles (and by another method) on a given line; and a regular pentagon, hexagon, or octagon, by methods suitable for the ground, or for drawing on paper.
11. To draw a tangent to a circle.
12. To draw a plain or a comparative scale, and to find the representative fraction; or the latter being given, to make the scale from it.
13. To calculate the area of a rectangle, triangle, or trapezoid; given the bases and perpendiculars.

Artillery and Projectiles, &c.

A short course (occupying about six pages) sufficient to assist in comprehending the employment of them in the attack and defence of a field work or fortress, extracted (principally) from the present course by Colonel Boxer; his plates to be the plates of reference.

Definitions of axis of a gun. Point-blank aim. Point-blank range. Angle of elevation of a gun; of a mortar. Horizontal fire; vertical fire; plunging fire; pitching fire; direct fire; oblique fire; reverse, cross, enfilading, flanking, and ricochet fire.

Initial velocity; remaining velocity; penetrating force or vis viva; momentum or smashing force.

Gunpowder and Projectiles.

English cannon and small-arms, gunpowder for; ingredients and proportions; how packed. Cartridges for cannon and small-arms; how made up.

Solid shot for smooth-bores; for Armstrong's. Shells. Hollow shot; proportionate weight to shell. Flight of splinters. Shrapnell shells, or diaphragm shells. Segment shells for Armstrong's. Bursting charge for shrapnell; least and greatest effective range. Common case; description; greatest effective range. Grape shot; description of; greatest effective range.

When wooden bottoms are used, and why.

Red-hot shot; how to load with. Liquid iron. Carcass shell. Light balls, ground and suspended. War rockets; description, use, advantage; three sizes; greatest effective range; necessary elevation for such range. Hale's rocket without stick.

Fuzes; use, application; percussion fuze; concussion fuze; time fuze. Tubes; use, application; friction and percussion tubes. Portfire. Slowmatch; rate of burning of each.

Smooth-bore Cannon.

Solid shot and shell guns, howitzers, and mortars. The use and distinctive formation of each. Definition of chamber. Divided into heavy and field ordnance; use of each; of what metal made. The usual calibres of those in ordinary use. How the range is increased in guns and mortars.

Rifled Cannon.

Armstrong guns; of what made, and how; description; principal advantages; the charge; point-blank range, and range with 10° elevation of 110, 40, 12, and 6-prs. Sort of cartridge. Fuzes.

Field Fortification.

Preliminary Observations.

Object of fortification; its usual division into field and permanent; principles the same in each; artificial and natural.

Object of parapet and ditch.

Explanations of "projection," "orthographic projection," "plan." Trace; elevation; section and profile.

How inclinations of slopes are expressed by fractions.

Profile of Works.

Command of a work; absolute or relative; of fire; of observation. Relief of a work.

Command sufficient to give cover; what dependent on; height suitable for level ground; when greater command is necessary; when small command may be used; greatest ordinary command to field works; least ditto.

Use of trench in rear of parapet, with or without ditch in front; different meanings to the terms trench and ditch; advantages and defects of the trench formation.

Thickness of parapet; measured at top; what dependant on; thicknesses proper to resist musketry and artillery.

Banquette, tread of; its use and position; slope and dimensions.

Slope of banquette; use and inclination; when steps are substituted.

Interior slope, why made steep; usual slope.

Superior slope; object, defect; usual slope on level ground; when steeper slope is required; steepest ordinary slope.

Crest of parapet (interior), define it; magistral line in field, why.

Crest plane, when necessary.

Exterior slope; usual slope, why; when gentler slope is used; when it may be revetted.

Exterior crest; thickness of parapet.

Berm; why necessary; usual dimensions; defect; methods of partially remedying.

Escarp; made as steep as possible; what the inclination is dependant upon.

Bottom of ditch; should have drainage slope; considered horizontal.

Depth of ditch; usual maximum, and reason.

Counterscarp; why usually steeper than escarp.

When ditch may be triangular in section; depth usually selected in preference to width; why.

App. XIII.
Royal Military College.

Glacis; its various uses.

(Here give a profile of a work with a glacis; the heights and bases of all slopes to be figured and lettered. A reference to be added.)

How to calculate dimensions of ditch for parapet of given profile.

Give here a couple of examples showing actual calculation.

How to make sandbag loopholes (and their substitutes) on parapets.

Stockade or timber parapet; positions suitable; how constructed; dimensions proper.

Loopholes; describe them; dimensions; position in a stockade.

How to occupy walls and hedges of different heights, as substitutes for lines of intrenchments.

Obstacles.

Why obstacles are required in aid of field works.

Why, generally, they should be in advance of counterscarp.

The conditions that all obstacles used as accessory defences should fulfil.

Palisades; their nature; how constructed; proper dimensions; suitable positions.

Fraisès; construction and dimensions; suitable positions.

Chevaux de frise; construction and dimensions; suitable positions; how connected together.

Abattis, how to make it; its covering glacis; when used in ditch against counterscarp.

Trous-de-loup; dimensions, maximum, and minimum; how arranged; use of stakes; labour to make.

Entanglement, how made.

Crows feet, shape and size; where used.

Pointed stakes, use of, on berm, bottom of ditch, &c.

Common fougass, how made; usual LLR; proper charge; different methods of firing.

Shell fougass, two different sorts; how made and fired. Depths to which different shells can form craters.

Stone fougass, how constructed; usual dimensions; charge and quantity of stones; effect; time and labour.

Inundations, how formed; greatest usual depth; depth at shallowest part; what number of dams depends upon; what the breadth of inundation depends upon.

How to render a shallow inundation unfordable.

How to form a dam: its proper profile. Object and construction of a waste weir. Sluice gates.

How dams are defended by works.

Best direction of an inundation with reference to a line of intrenchment.

Revetments and Reveting Materials.

Object of revetments; names of the usual materials used.

Sods; their usual dimensions; labour required to cut; how built; supporting slope; number required per square foot of revetment; advantages and defects.

Gabions (brushwood, common); dimensions; how made; size of brushwood; number of men, tools and time required; average weight.

Gabions (iron); details of each sort, with advantages and defects.

How to build a gabion revetment.

Fascines; dimensions; how made; men, tools, and time required to make; average weight; how to build in a revetment; supporting slope; advantages and defects.

Use of anchoring pickets.

Other uses for fascines; roofing magazines, block-houses, &c.; forming drains.

Sandbags; dimensions; weight, tarred and untarred; content and weight when filled; how built in a revetment; supporting slope; number required; advantages and defects.

Other uses; as for forming loopholes, repairing damages in bombardment.

Casks, substitutes for gabions.

Planks, how used as a revetment.

Hurdles, how to make; dimensions and time.

Dry stone walls for interior slopes; splinters.

Description of Field Works.

Technical terms explained. Salient and re-entering angles; line of defence; angle of defence; flank, its various meanings; outline of a work; faces; gorge; capital; open and closed works.

General principles to be observed in determining the outlines of field works.

Open Works.

Redan, shape, usual size; defects when isolated; methods of remedying or lessening; suitable positions; examples.

Flèche, description of.

Double redan. Triple redan. Description of.

Lunette, shape; ordinary size; flanks, how traced; its defects, and how to remedy them; suitable positions.

Closed Works.

Either redoubts or forts.

Redoubts may be any shape most convenient, regular or irregular.

Closed works exposed to enfilade or reverse fire; why this is felt more in small than in large works; traverses much required; necessary to fix minimum size; difficult to fix maximum, and not important. Size of redoubts, what dependent on. Garrison, what dependent on; which sides have double ranks. Reserve, duty of.

Defects of quadrilateral or polygonal redoubts; how remedied. Circular redoubts; why not usually used.

Entrances to closed works, where placed; traverse to cover opening; bridge across ditch, how made; gateway; stockade to replace traverse in certain cases. Bridge of rough timber.

Blockhouses, construction of simple ones; how to resist artillery; usual shape; when shaped like a cross; when two floors may be used, and how made.

Forts, why larger than redoubts; advantage of parapet flank defence for field works; names of ordinary regular forts.

Star forts, proposed to remedy defects of redoubts; how to trace them when regular; to trace when irregular; usual lengths of faces; to calculate dead space at re-entering angles. Defects of star forts. Double star fort.

Bastioned forts, most perfect of all field works, but require large garrisons; used for only very important positions.

Trace of a regular bastioned fort; object of perpendicular; reasons for fixing its length; greatest and least lengths for exterior sides.

Names of different parts of a bastioned fort.

Different ways of tracing counterscarp and excavating ditch of curtain.

How to trace an irregular bastioned fort.

Demi-bastioned forts, description of.

Reduits.

Object of a reduit; may be of different natures according to size of main work.

How traced in a fort; command required for uncovered work; reasons in favour of covered buildings as reduits.

Details, &c.

Embrasures, direct or oblique; sill, height above the terreplein; sole, slope of; cheeks, how reveted and protected; neck; mouth; genouillère; merlon.

Chatham dimensions and method of tracing; use of hurter; neck may be narrowed with rifled guns.

Defects of embrasures; use of mantlets.

Suitable positions.

[*General notion only to be expected of these parts.*]

Barbettes, usually at salients, why; may be on face; dimensions required for one gun; terreplein level.

Ramps, use of; dimensions and slope.

Defects of barbettes; use of bonnettes and traverses.

Traverses, various kinds; splinter proof; to mask openings; to stop enfilade fire; to protect from reverse fire; suitable dimensions and positions for each.

Magazines to be in secure positions; many small ones better than one large one; methods of constructing; lean-to; rectangular; necessity of drainage.

Casks or barrels as substitutes.

Platforms, gun when used; construction and usual dimensions of various parts.

Field platform of three planks. When no platform is used, terreplein should be hardened with gravel.

Barrier gates, dimensions and details of.

Bridges over ditches, dimensions and details of the different parts; how made; trestle to support.

Execution of Field Works.

Determine outline of work, according to object of work, intended garrison, &c.

Select the profiles of different parts, according to the nature of ground, exposure to fire, and degree of cover required.

Picket the angles of the work in magistral line.

Set up profiles on the faces and oblique profiles at the angles, both salient and re-entering.

How to set up a profile (direct or oblique).

Distribution of working party, how told off; tools required; how posted for work; how to excavate the ditch.

Extra diggers in very hard or difficult soil; how posted.

How to estimate the time required to throw up any work.

Importance of drainage; description of usual methods of draining.

Bridge Heads.

On level ground and on one side only of the river.

Definition; use and best position with respect to the course of the river.

Trace, under various circumstances; Communications through. Passage of troops to be covered from fire and sight. Reduits. Defences on other side of river. Precautions to prevent destruction of bridge or bridges by floating bodies.

Depth of fords; how to search for them.

Lines of Intrenchment.

Division into Continuous and Broken.

General use of lines; advantages of broken lines.

Continuous lines of redans (Vauban's), improvement in their tracing; advantages and defects of each tracing.

Of tenailles; of bastions; indented or crémaillère.

Lines, without or with bastions at intervals.

Advantages and defects of each tracing.

Positions for artillery in defence of broken lines in one or two series. Lines of Torres Vedras. Lines of Gallipoli in 1854.

Defence of Field Works.

Defence of a field work against attack by surprise or open force; of a street or road by barricade, &c.

How to construct a barricade for a street or to a door; defence of a ford; of a house step by step, from ground to upper floors. Defence of a village.

Blanshard's pontoon bridge; large and small; advantage and defects.

Defilade.

By trace; by traverses; by bonnet; by sinking terreplein. An open work by height of parapet, and by parapet and parados. A closed work by parapet, by parados, and by parapet and sinking terreplein. Height of cover 8 feet above ground or 2 feet above a 6-feet man, either on banquette or on terreplein.

PERMANENT FORTIFICATIONS.

Definitions peculiar to this branch.

Distinguishing characteristics of permanent profiles in reference to field profiles.

A rampart; its use; dimensions; description; its slopes, and reasons for each sort of slope, and for the deviation permitted, and for the dimensions.

Varieties. Methods of supporting interior of rampart.

Thickness of permanent parapets; reasons.

Do. of masonry parapets.

Defect of supporting parapets with masonry.

Occasional formation of the interior slope of a parapet.

Crest planes.

Conditions determining the absolute command of a parapet on a rampart. How to calculate the necessary command. The salients should have a greater command than the inner ends of faces.

Ditches, three sorts. Conditions which determine the minima and maxima of the breadth and depth of ditches. Dry and wet ditches; advantages and defects of each compared. Ditches of outworks.

Cunettes. Batardeaux. Barbettes. Reveted escarps and counterscarps. Conditions determining height of the former. Slope and thickness. Counterforts. Counterarches. Cordon. Berm. Chemin des rondes. Defects of the two last. When a chemin des rondes is advantageous, and better than other constructions of escarps. When a reveted counterscarp is unnecessary.

Communications.

Ramps. Caponnières. Small Steps or pas de souris. Posterns. Sallyports. Principles fixing their usual situations. Slopes and dimensions. Bridges and drawbridges. Strength and positions of palisades.

Occasional Works.

Fausse braie, its nature, use, defects.

Cavalier, its nature, uses, and ordinary situation.

Bonnet, its nature; use. Martello towers.

Citadels, their uses and situation. Esplanade.

Tambours. Lodgments. Advanced works.

Definition and use. Detached works; definition, use, and position.

Retrenchments. Various tracings. Cavalier retrenchment.

Coupure retrenchment. Use of retrenchments.

Difference between a retrenchment and a reduit.

A reduit of an outwork should not be a redoubt or closed work.

General description of a bastion system and of Vauban's methods, and of the outworks.

Definition of a bastion; its uses; dimensions, founded on reasons given. Length and definition of a "front."

Reasons for the maximum and minimum.

Full, hollow, and flat bastions, compared.

Advantages gained by having large salient angles to bastions; numerous fronts (and therefore large towns) have large bastions. When Vauban made faces of bastions longer than $\frac{2}{7}$ of the length of front.

Conditions determining the least length of flanks of bastions.

Conditions determining length of a curtain; its uses. Orillons and concave flanks; why introduced, and when that construction was abandoned.

Outworks.

Tenaille, its description and use; varieties of tracings; determination of its greatest relief.

Ravelin or demilune; its description and uses; defects of the early ravelins; gradual improvements; defects of flanks of ravelins.

Covered way; nature and uses of this outwork of field profile. Reasons for its limited breadth. Its defects. Its division into salient and re-entering places of arms and branches, and the special uses of these parts. Reason for the faces of re-entering places of arms forming flanking angles of 100° with the branches.

Why palisades are placed in certain works only.

The nature and use of a glacis parapet to the covered way and caponnières.

Traverses, their dimensions, nature, uses, and defects; distance apart.

Method of tracing the 1st system of Vauban.

App. XIII.

Royal Military College.

Table of the dimensions of two types of profiles of the 1st system of Vauban.

Defects of the system; comprising four defects in ravelin; defect of the bastions when on inferior polygons; and of the escarp.

Vaulted Works and Blindages.

Casemates or bombproofs, their nature and use; where formed.
Haxo casemates; nature, uses, and position.
Loopholed galleries; positions and use.
Casemated caponnières (kaponiers).
Safety redoubts, or reduits de sûreté.
Blindages; constructions, uses.

Attack and Defence of Vauban's 1st System.

Very concise introduction, comprising reasons for the difference between the attack on field works and that on permanent works; large quantities of siege materials for revetments, &c. necessary; two causes for the present superiority of the attack on, over the defence of the bastioned systems.

Estimate of the proper force of artillery and troops for the defence of, and for the siege of, fortresses, as given by the late Generals Sir J. Jones, Sir C. Pasley, Sir A. Dickson, and other high authorities, supported by examples.

Lines of circum and countervallation.

Investment, nature and use of; how to conduct; preparations during the investment by besiegers and by the garrison. Sap-roller, sap-faggot, gabions, fascines, revetment, and tracing pickets.

Very concise statement of the proceedings in order (in parallel columns on the same page, and divided into five natural periods) of the active siege operations founded on the statements of the late Sir J. Jones, R.E., and on Bousmard's treatise. The ground supposed flat (and neutral) and the artillery smooth-bore. Every term or operation explained by notes at the end of the text, with numerical references; with examples of actual sieges.

Explanatory Notes.

1. Improved siege ordnance.
2. Pierriers. Royal and Coehorn mortars.
3. Parks.
4. Artillery attack.
5. Prolongations of faces and capitals of works; use, and how to take them up.
6. Approaches; laying down at night; protection.
7, 8, 9. Sap-rollers, sap-faggots, gabions, fascines; revetment and tracing pickets; weight, labour, use.
10. First parallel; use; length and distance on principle; tracing; construction; profile.
11, 12. Covering parties and guards of trenches; depôts.
13. Enfilading and counter-batteries; sorts; tracing; construction; time; labour.
14. Expense magazines of the late Sir J. Jones.
15, 16. Masked batteries; arming batteries.
17. Full charges; ricochêt do.
18, 19. Traverses; counter-approaches.
20. Retrenchments; time and labour.
21. Second parallel; distance; length; construction; flying sap.
22. Constructing batteries under fire.
23, 24. Demi-parallels; howitzer batteries to enfilade covered way.
25, 26. Single and double full sap; double sap, with lock traverses, Sir J. Jebb's, Sir Harry Jones'; when best to use direct advance by double sap; advantage of Jebb's sap over old double sap: time occupied by single and Jebb's double sap.
28. Sorties; duties; how to arrange them in the covered way.
29. Cover for musketry and artillery.
30. Constructions of third parallel by single and half-double sap.

[*Termination of 1st or obligatory course.*]

Commencement of voluntary Course.

31, 32. Circular portions. Trench cavaliers. Use of each; how formed.

33, 34. Crowning covered way by sap or by assault.

35, 36. Counter and breaching batteries in the crowning. Subterranean and blinded descent into ditch.

37. Breaching from crest of glacis, or, as in the Peninsula, at a distance; estimate of time and shot and shell; width of breaches.

38. Passing a dry or a wet ditch.

39. Crowning a breach by sap (Vauban's method as actually done) or by assault.

40. Defence of a breach. Breach at Badajos.

Outworks extraordinary. Advanced and detached Works.

Grand and demi tenaillons. Bonnets. Counterguards or couvre face. Horn and crown works.

The trace and position; use or uses; defects; four advantages of counterguards over grand tenaillons in their application to remedy the want of saliency of Vauban's small ravelins.

Only flat ground taken into consideration.

Advanced lunettes and covered way. Detached works. Definition. Nature; uses; trace; position. General size of. Precautions in structure and garrison.

Modern bastion system. Method of tracing; characteristics; advantages in plan and in profile over the old bastion (French) system. Table of dimensions of profiles. General defects of all the French bastion systems.

German System.

Description of it; distinguished by profile; plan of any sort to suit ground; how adapted to an independent fort or citadel; how to the fortification of a town. Examples in view:—Fort Alexander at Coblenz; Posen; Rastadt; Ingolstadt. Tracing of Fort Alexander. The most striking advantages of the German over the bastion systems, detailed.

Description of some types of the German system as employed in England,—on Portsdown Hill, for example.

Mines and Countermines.

Definitions of shafts; galleries; branches; chamber, LLR.; radius of rupture, &c. &c. Calculation, as at Chatham, of charge for a two and a six line crater mine. How to sink a shaft and drive a gallery, with frames and sheeting. Time occupied. To charge mine; lay fuze; tamp; length of tamping.

Why a branch size gallery is used, as time is not gained in the excavation; diameter of hose; casing tube.

A very concise account of the disposition of the galleries of countermines; distance between listening galleries. Camouflets; fougasses; nature and use.

The use of scarp and counterscarp galleries; use of surcharged mines six-line craters; employment of the countermines against besiegers; general notice of the method.

Military Drawing and Surveying.

Section I.

First Term, 1st two months.

1. Drawings with sections from examples.
2. Details and conventional signs.
3. Sketching from models.

Section II.

First Term, 2nd two months.

1. Practical Geometry on the ground.
2. Base and triangulation on the ground. The work laid down in Hall by construction, and by computation also, by cadets sufficiently advanced.

3. Traversing with Theodolite and Chain. The work laid down in the Hall on the same plate.

Section III.

Last Term, four months.

1. Contouring taught on the model.
2. Two Field Sketches.
3. Two Eye Sketches.
4. Examination Sketch.

Military History.

The instruction in this branch is by lectures given once weekly to each company. Memoirs are subsequently written by the students from the notes taken during lecture. These memoirs are marked by the Instructors according to their value, and are referred to by the students prior to examination at the close of the term.

The course of a single term would comprise three or four initiatory lectures on the Theory of War, and the detailed history of, circà, three campaigns.

Thus the course of the present term (2nd 1864) includes :—

1. Theoretical Instruction.
2. Campaign of Vimeiro (Wellesley).
3. Sir J. Moore's Campaign,
4. Campaigns of the Douro and Tagus (1809).
5. Campaign of Napoleon in the Valley of the Danube. (Wagram, 1809).

French.

The instruction consists in written translations into French and English out of the Exercise Book. Questions and conversations on the same (in French). Lectures on the grammatical and idiomatical peculiarities of the French language. Compositions or themes on various subjects connected either with Military or General History.

The books used are de Charente's Grammar and Exercises and Roche's "Prosateurs."

German.

The instruction consists in translation from German to English and English to German. Dictation and conversation.

The books used are Tiark's Grammar and Exercises and Demmler's Reader.

Natural Philosophy.

The course of lectures on Experimental Sciences extends over two terms, one of which is devoted to Pneumatics and Heat, and the other to Magnetism and Electricity. The text book used is Ganot's Elements of Physics, published by Baillière. The lectures are elementary in character, but, so far as time and the knowledge of the students permits, attention is chiefly directed to those points which have a special or professional interest for the military student.

Pneumatics. The physical properties of gases. Atmospheric pressure, the means of demonstrating it, and the leading phenomena of which it is the

cause. The Air Pump. Measurement of the atmospheric pressure. Barometers. Ballooning.

Heat. Its source. Mode of measuring Temperature. Thermometry. Expansion of Bodies by Heat. Changes of State. Specific and latent heat. Conducton and radiation of Heat. Meteorological Phenomena mainly due to Heat.

Magnetism. Properties of Magnets; method of making artificial Magnets. Terrestrial magnetism, and modes of observing it.

Frictional Electricity. Production and modes of detecting frictional electricity. Distribution, conduction, induction, and condensation of electricity. Electrical machines. Leyden Jar and the effects of its discharge. Application of this discharge to firing mines. Atmospheric Electricity.

Voltaic Electricity. Production of the voltaic current, and modes of determining its existence. Principal forms of voltaic batteries. Phenomena of the voltaic current. Thermal effects and their application to firing mines. Electro-magnetism and electric telegraphy.

Voltaic and magnetic induction. Ruhmkorffs' coil, and the magneto-electrical machine, with their practical application. Electrodynamics.

Geology.

Prospectus of Lectures on Geology and Mineralogy for the Royal Military College, Sandhurst. August—December 1864.

Thomas Rupert Jones, Esq., F.G.S.

	Reference to Class Books.	
	Page's Introd. Text-book. 5th Edit.	Dana's Manual. 8th Edit.
	Page	Page
I. Introductory.		
Principles and Objects of the Science of Geology -		
II. Definition of Geology.		
Its division into—	7–12, 153	—
1. Descriptive Geology - - - - -		
2. Dynamical Geology - - - - -		
3. Theoretical Geology - - - - -		
III. The Physical Characters of the Globe.		
Its Shape, Size, and Density; Distribution of Land and Water. The "Crust of the Earth" formed of "Rocks."	—	—
IV. The Geological Conditions of the Bagshot District.		
Gravel, Sands, Clays, Chalk, &c. of the S.E. of England.	—	—
V. Natural Agencies at present changing the Earth's Surface.	13–23	
Materials of Strata; their nature and origin. Formation of Strata by Rivers, Lakes, and Seas.	138–143	348
Volcanic Materials - - - - -	47–50	—
VI. The Structure of Bedded Rocks.		
Stratification; horizontal, inclined, undulated, and contorted; conformable and unconformable; faulted, overlapping, outlying, and denuded strata. Dip and Strike. The Clinometer. The formation of Hills and Valleys. Geological Maps and Sections.	24–28	—

App. XIII.

Royal Military College.

	Reference to Class Books.	
	Page's Introd. Text-book. 5th Edit.	Dana's Manual 8th Edit.
	Page	Page
VII. The Nature and Ingredients of Rocks.		
Neptunian—formed in Water—Aqueous or Sedimentary - - - - - } Stratified	15–26	349
Æolian—accumulated by Wind—Aërial - }		
Volcanic } Fire-born, Igneous, or Hypogene } Unstratified.	43–51	350–357
Plutonic } (*nether-born*) }		
Geyserian—formed from solutions - - }		
Sedimentary Rocks when much altered—Metamorphic	52–58	—
VIII. Aqueous or Sedimentary Rocks, and their Fossilized Plants and Animals.		
1. Sedimentary Rocks of mechanical origin. Action of Air and Water in the disintegration and reconstruction of Rocks.	15–20	359–373
Siliceous, or Sand-rocks (Sand, Sandstone, Grit, Conglomerate); Calcareous, or Lime-rocks (Limestone, Marble, Chalk); Argillaceous, or Clay-rocks (Clay, Shale, Loam, Marl).	30–34, 85–91, 138–150	
2. Of Chemical Origin:—Tufa, Sinter, Veinstones, and Nodules; Rock-salt, Gypsum, Dolomite.		
3. Of Organic Origin:—Coral-rock and Shell-rock, Carbonaceous and Bituminous Deposits.		
IX. Igneous or Volcanic and Plutonic Rocks: Lavas (Basaltic, Trachytic), Trap-rocks, Granite.	43–51	351–359
X. Altered or Metamorphic Rocks: Slates, Schists, Gneiss. Mineral Veins and Precious Stones.	52–58	
Concretionary, Prismatic, Foliated, and Cleaved Rocks	29, 53, 56	—
XI. Disturbances of the Strata.		
Evidence of age, afforded by the different conditions and relations of Stratified and Intruded Rocks.	13, 14, 35	—
Elevation; Depression; and the Successional Formation of Strata.		
The old Hydrographical conditions of the Bagshot and other districts.	—	—
XII. Classification of Rocks by means of Fossils. Palæontology.		
Conditions of Fossilized Remains of Animals and Plants; their Relations to Existing Nature. Vegetables. Invertebrates (Protozoans, Cœlenterates, Molluscs, Echinoderms, Annelides, Crustaceans, and Insects); Vertebrates (Fishes, Amphibians, Reptiles, Birds, and Mammals).	—	—
XIII. Geological Succession of Strata forming the "Crust of the Earth." Primary or Palæozoic; Secondary or Mesozoic; Tertiary or Cænozoic.		
1. Primary { Laurentian and Huronian. Cambrian and Silurian. Devonian. Carboniferous. Permian. } 2. Secondary { Triassic. Jurassic or Oolitic. Cretaceous. } 3. { Tertiary and Recent. }	35–42, 55–153	—
XIV. Objects and Meaning of Mineralogy and Crystallography.		
The Mineralogical aspect of the Constituents of the Rocks, Stratified and Unstratified.	30–33	13–18
XV. Characters of Minerals.		
Crystallography. Crystalline Forms: Systems of Crystallization.	—	19–54

	Reference to Class Books.	
	Page's Introd. Text-book. 5th Edit.	Dana's Manual 8th Edit.
	Page	Page
Structural, Optical, Electrical, and other Characters; Odour, Taste, Hardness, Specific Gravity; Chemical Composition of Minerals. Analysis by Acids, Heat, &c.	—	55–71
XVI. Elementary Substances: Binary and other compounds; Silicium, Calcium, and Aluminium, and their Compounds.	—	72–74 132, 112, 158
XVII. Constituents of Granitic Rocks	31-34, 44	351
Felspar and Clay	—	176, 371
Quartz and Sand	—	132, 360
Mica; Talc; Chlorite	—	143, 191
XVIII. Carbonaceous, Sulphurous, and Alkaline Rocks and Minerals.	32	80–107
XIX. Metallic Minerals.		
Zinc, Tin, Lead, Iron, Copper, Silver, Gold, &c.	30	202–333 403–407
XX. Practical Uses of Geological Knowledge:	—	—
Applied to Agriculture, Engineering, Architecture, and Mining; Drainage, Water-supply (natural and artificial), Constructive Materials (Clays, Cements, Stones, Slates, &c.), Roads, Canals, Earthworks, &c. Explanation of Geographical Features—Cliffs, Gorges, Valleys, Table-lands, Hill-ranges, Hill-rocks, &c.		

Landscape Drawing.

Pencil Drawing from the flat, and at a more advanced stage drawing from plaster models with pencil or brush.

Appendix XIV.

Examination of the Cadets of the Royal Military College for Commissions in December 1863.

Mathematics.—Rev. W. N. Griffin, M.A.

Maximum of Marks - 1,200
Minimum „ - 300

No. of Marks obtained on this Paper.	No. of Candidates.
0 - 300	1
300 - 400	1
400 - 500	14
500 - 600	38
600 - 700	24
700 - 800	18
800 - 900	13
900 - 1,000	10
1,000 - 1,100	5
1,100 - 1,200	1
Total	125

APP. XIV.

Royal Military College.

Arithmetic.

1. Find the cost of 2 tons 4 cwt. 2 qrs. at 9*l.* 6*s.* 8*d.* per ton.
2. Add together $\frac{3}{7}$, $\frac{4}{5\frac{1}{10}}$, and $\frac{8}{3}$ of $\frac{41}{34}$.
3. Reduce ·00025 of 1 lb. Troy to the fraction of 1 dwt.
4. Calculate the amount of $2\frac{3}{4}$ per cent. on 173*l.* 6*s.* 8*d.*
5. Three men are in partnership, and for every pound which the first advances to their common capital, the second advances two pounds, and the third advances five pounds. When their profit is divided among them, in proportion to the capitals which they supply, how will 820*l.* be distributed?
6. Extract the square root of ·00630436.

Algebra.

1. Find the cube of $2x^2-x-1$.
2. Prove that

$$\frac{x^2+3ax+2a^2}{x^2-ax-2a^2} - \frac{x^2-3ax+2a^2}{x^2+ax-2a^2} = \frac{8ax}{x^4-4a^2}$$

and that $\dfrac{a+2\sqrt{bc}-b-c}{b+2\sqrt{ac}-a-c} = \dfrac{\sqrt{a}-\sqrt{b}+\sqrt{c}}{\sqrt{b}-\sqrt{a}+\sqrt{c}}$.

3. Solve the following equations:

(1) $\dfrac{2x}{3} - \dfrac{2x-5}{4} - \dfrac{4x}{9} = \dfrac{4x-7}{11} - 1.$

(2) $9x^2-12x=5.$

(3) $\left.\begin{aligned} x(x+y) &= 9 \\ y(x+y) &= 16 \end{aligned}\right\}$

(4) $\left.\begin{aligned} x-y &= 3\left(\frac{1}{x} - \frac{1}{y}\right) \\ x+3y &= 8 \end{aligned}\right\}$

4. When money amounting altogether to 9*l.* 19*s.* 6*d.* is counted, it is found that there are two florins for every half-crown, and three sixpences for every florin. How many coins of each kind are there?

5. Two measures differing in content by a peck are used for measuring out corn, and the number of times that three quarters of corn fill one measure exceeds by 8 the number of times of filling the other measure. What do these measures contain?

Euclid.

1. The complements of the parallelograms which are about the diameter of any parallelogram are equal to one another.

If one of the parallelograms about the diameter is four times the other, find the ratio of the two parts into which the diameter is divided.

2. Equal straight lines in a circle are equally distant from the centre, and one circle can touch them all.

3. Inscribe an equilateral and equiangular hexagon in a given circle.

If a circumscribed hexagon touch the circle at the angular points of this inscribed hexagon, compare the areas of the two.

4. State and prove the proposition "Ex æquali." Enunciate some proposition of the sixth book wherein this principle is brought into use.

5. Equal triangles which have one angle of the one equal to one angle of the other have the sides about their equal angles reciprocally proportional, and the converse.

ALGEBRA, TRIGONOMETRY, AND MENSURATION.—Rev. Canon HEAVISIDE, M.A.

Maximum of Marks on this Paper and the following one in Mechanics - - - - - - - 2,400
Minimum - - - - - - - 0

No of Marks obtained on this and the following Paper.	No. of Candidates.
0 - 100	13
100 - 200	21
200 - 300	13
300 - 400	5
400 - 500	7
500 - 600	6
600 - 700	1
700 - 800	4
800 - 900	5
900 - 1,000	2
1,000 - 1,100	4
1,100 - 1,200	4
1,200 - 1,300	2
1,300 - 1,400	4
1,400 - 1,500	1
1,500 - 1,600	1
1,600 - 1,700	1
1,700 - 1,800	2
1,800 - 1,900	1
Total -	97

1. Find (l) the $(n)^{\text{th}}$ term of the series a, $a-b$, $a-2b$, &c., and prove the sum of n terms of this series to be equal to $(a+l)\frac{n}{2}$.

Find the sum of 12 terms of the series $\frac{15}{4}$, 3, $\frac{9}{4}$, &c.

The $(n)^{\text{th}}$ term of an arithmetic series is $\frac{5n-4}{6}$, write down the three first terms and the sum of n terms of this series.

2. Find by the aid of the logarithmic tables:

(1) $(35{\cdot}746)^{\frac{1}{3}}$.

(2) The 9th term of $1+\left(\frac{21}{20}\right)+\left(\frac{21}{20}\right)^2+$, &c.

(3) The amount of 1,250*l.* 10*s.* in 3 years at $4\frac{1}{2}$ per cent. compound interest, the interest being paid quarterly.

3. Expand $(a^2-x^2)^6$ by the Binomial Theorem.

Write down the 6th term of $\frac{1}{\sqrt{a^2-x^2}}$.

In the expansion of the infinite series

$$(1+x+x^2+x^3+\&c.)^2$$

write down the term involving x^3.

4. Define the cosine and cotangent of an angle.

Prove (1) $\text{Cos}\,(90-\text{A})=\sin \text{A}$.

(2) $\text{Tan}\,\overline{45+\text{A}}-\tan\overline{45-\text{A}}=2\tan 2\,\text{A}$.

5. In any triangle, of which a, b, c are the sides opposite to the angles A, B, C respectively,

Prove

(1) $\frac{a}{b}=\frac{\sin \text{A}}{\sin \text{B}}$.

(2) $\text{Sin}\,\frac{\text{A}}{2}=\sqrt{\frac{s-b\,.\,s-c}{bc}}$ *or* $\cos\frac{\text{A}}{2}=\sqrt{\frac{s\,.\,s-a}{bc}}$.

App. XIV.

From these expressions verify the result $\left(\sin\frac{A}{2}\right)^2+\left(\cos\frac{A}{2}\right)^2=1$.

Royal Military College.

6. ABC is a right-angled triangle, C the right angle. Given A=54° 17′, BC=227·4 feet; solve the triangle.

7. ABC is an oblique-angled triangle. Given AC = 690, BC = 464, and the angle A = 37° 20′. What would be peculiar in the solution of the triangle? Find the third side of that triangle which is the greatest consistent with the above data.

8. A railroad AB runs north, and a railroad AC runs north-east, from A. A train starts from A along AB with a velocity of 25 miles an hour; after half-an-hour a train starts from A along AC, with the velocity of 30 miles an hour; find the distance of the two trains from each other three hours after the first train has started.

9. A circle has a diameter of 40 feet, find the area of a sector of this circle which contains an angle of 40°.

10. The area of a regular polygon inscribed in a circle is to the area of the regular polygon of the same number of sides circumscribed about the same circle as 3 to 4, find the number of sides of the polygon.

11. A pyramid has for each of its four plane faces an equilateral triangle with 10 feet in each side, find the solid content of the pyramid, and the inclination of any two of its plane faces to each other.

Mechanics and Hydrostatics.—Rev. Canon Heaviside, M.A.

For analysis of Marks obtained see preceding Paper.

1. If two forces, P and Q, act on a point, what must be their directions so as to produce, (1) the greatest, (2) the least, pressure on the point?

Prove the proposition known as the "Parallelogram of Forces," for the magnitude of the resultant, assuming its direction. Two forces acting on a point are in the ratio of 3 to 2; the resultant is a mean proportional between the forces; find the angle at which they are inclined to each other.

2. Define the centre of gravity of a system of bodies.

Given the centre of gravity of a plane area and of a portion taken away from it, find the centre of gravity of the area that remains.

One fourth of a given triangle is taken away by a line parallel to the base, prove the distance of the centre of gravity of the remaining trapezoid measured from the vertex (A) of the given triangle, along the line AD bisecting the base, is equal to $\frac{7}{9}$ AD.

3. If two parallel forces act on different sides of the fulcrum of a straight lever without weight and produce equilibrium, state the ratio of the forces to each other.

If the forces, instead of being parallel, make given angles with the lever, find the resolved part of each force in directions along the lever and perpendicular to it, and hence deduce the condition of equilibrium in this case.

ACB is a uniform bent lever, fulcrum C, the arm BC is to AC as the diagonal of a square is to its side, find the angle ACB when the lever rests about the fulcrum with the shorter arm AC horizontal.

4. What is meant by a unit of work? When is a steam engine said to work with one-horse power?

Determine the horse-power of an engine which is to raise 13 cwt. from a depth of 70 fathoms in 3 minutes.

5. When a pressure is exerted against a rough plane, within what limits must it act relatively to the normal, so that the pressure shall be resisted by the plane, whatever its magnitude.

A force (P), acting parallel to the horizon, just sustains a body of given weight (W) on a rough inclined plane, the angle of which is (θ). (W) will just rest without support on a plane of the same material where the angle of inclination is 45°. Prove $\tan\theta=\frac{W+P}{W-P}$

6. A wall of given height and material is acted on by a pressure along a line making a given angle with the horizon, find the greatest pressure it can bear without falling.

A section of a wall of brickwork is 2 feet thick and 25 feet high, find the greatest pressure it will bear on the inner edge of its summit in a direction inclined at an angle of 60° to the horizon; the specific gravity of brickwork being 2·168, and the weight of a cubic foot of water 62·5 pounds.

7. How is the force of gravity at the earth's surface estimated? How is the measure of gravity related to the space a body falls through in vacuo in one second?

If a body fall from rest under the action of gravity (g), through a space (s), acquiring a velocity (v), prove $v^2=2gs$.

How high will a body ascend projected with a velocity of 644 feet in a second?

Two bodies are projected at the same instant from opposite ends of the same vertical line, each with the velocity that would be acquired in falling down the line; find where the bodies will meet.

8. State the second law of motion, and show how it is applied to determine the position of a projectile after it has been in motion for a given time.

Three equal bodies are projected at the same instant from the same point in the same vertical plane, but with different velocities and at different angles; find the height of the common centre of gravity after (t) seconds.

9. Find the work accumulated in a body of given weight moving with a given velocity.

When a train of 50 tons is moving along a horizontal road at the rate of 17½ miles an hour, the steam is suddenly turned off; how far will the train run if the friction be 8 pounds per ton?

10. Define specific gravity; and show how to find the specific gravity of a substance by weighing it in water.

A body (A) weighs 4 ounces in a vacuum, another body (B) weighs 3 ounces in water. When A and B are attached to each other they weigh 2¼ ounces in water; find the specific gravity of A.

11. Explain the action of the siphon?

Field Fortification.

Captain Schaw, R.E.

Obligatory Course.

Maximum of Marks on this and the two following Papers 2,095
Minimum „ „ „ 300

No. of Marks obtained.	No. of Candidates.
0 - 300	4
300 - 400	14
400 - 500	17
500 - 600	18
600 - 700	18
700 - 800	15
800 - 900	12
900 - 1,000	8
1,000 - 1,100	7
1,100 - 1,200	4
1,200 - 1,300	3
1,300 - 1,400	3
1,400 - 1,500	1
1,500 - 1,600	1
Total	125

1. Construct a square on a base 1 inch long. On three of its sides construct equilateral triangles projecting outwards. Reduce the heptagon so formed to a triangle of equal area.

2. What is the composition of English gunpowder? What is the difference between the powders used for cannon and for small arms, and what is the reason of the difference?

APP. IV.

Royal Military College.

3. What is the shape of the bullet used with the Enfield rifle? What is the advantage of this form over the spherical bullet? Why could it not be used with the old musket?

4. Explain the following terms: "windage," "point blank range," "line of sight," "enfilade fire," "direct fire," "vertical fire."

5. Draw the profile of a field-work, the parapet being 12 feet thick and 8 feet high; the ditch 12 feet wide; berm, 3 feet; slope of escarp $\frac{2}{1}$, and of counterscarp $\frac{2}{1}$. Why are different slopes given to the escarp and counterscarp? Against what description of ordnance would the parapet afford protection?

6. Draw the plan of the magistral line of a redan with flanks. Give the salient angle the smallest opening admissible, and give the faces the maximum and the flanks the minimum lengths which are consistent with a perfect musketry defence. Figure the dimensions, and choose your scale.

7. A square redoubt has a side of 38 yards, and there are barbettes for field guns, at two of its angles. What it the largest garrison which should be placed in such a work, and for what reasons?

8. Draw the plan of the magistral line of a front of a pentagonal bastioned field fort. Show that the flank defence is complete for a garrison of infantry.
Scale for plan, $\frac{1}{1800}$. Scale for profile, $\frac{1}{240}$.

9. The dimensions of a cylindrical pontoon are as follows: total length, 25 feet; diameter 3 feet; ends hemispherical. The weight of two such pontoons, with their superstructure, when formed into a raft, is 2,800 lbs. What weight will they bear in addition, without sinking below their axes?

PERMANENT FORTIFICATION.

Captain H. SCHAW, R.E.

Obligatory Course.

1. The distance between the exterior and interior sides of a permanent bastioned front having a full revetment is 70 yards, the lines of defence and flanks are 260 and 45 yards long respectively. The angles of defence are 100°. Determine the relief of the flanks so that the whole of the ditch may receive musketry defence. Explain the construction.
Scale for trace, $\frac{1}{1440}$; for profile, $\frac{1}{300}$.

2. What are the three principal conditions which it is desirable should be fulfilled in determining the profile for a permanent work?

3. Construct the profile of a permanent work with a full revetment from the following conditions: The whole of the wall to be covered from the view of an enemy's batteries, 550 yards from and 25 yards below the crest of the glacis. The width of the ditch at bottom is to be 70 feet. There is to be a covered way, and the glacis is to be defended by a grazing fire of artillery.
Scale, $\frac{1}{300}$.

4. Draw a section through the curtain and tenaille of a fortress on Vauban's First System, and explain the uses and defects of the tenaille.

5. Give a sketch of a rampart with a sloping revetment and chemin-des-rondes. Describe the advantages and defects of such a revetment.

6. Give sections drawn by hand with figured dimensions of the batteries which would be used in the following positions: 1, a counter battery at the commencement of a siege; 2, a ricochet battery in the 2nd parallel. State the reasons for the construction preferred in each situation.

7. Explain the method of tracing the approaches between the 1st and 2nd parallels, and give a section of an approach, with dimensions.

8. What is meant by a covering party in a siege? What are the duties of the guards of the trenches? Where are they placed, what should be their strength, and how often are they relieved?

9. How many magazines should be constructed for a battery of 12 guns? Where should they be placed? How much ammunition should they contain? Explain generally their construction.

Fortification.

Captain H. Schaw, R.E.

Voluntary Course.

1. Draw a section of a Trench Cavalier. Explain its object, its position, and its construction. Scale $\frac{1}{120}$.

2. Explain the method of crowning the covered way by assault. State under what circumstances such a mode of proceeding would be adopted in preference to the regular attack by sapping.

3. What batteries are constructed on the glacis in the attack of a fortress on Vauban's First System? Describe their objects, their positions, their armaments, and the mode of constructing and arming them.

4. Draw two sections (longitudinal and transverse) of a blinded gallery of descent into the wet ditch of a ravelin, the level of the water being 5 feet below the level of the covered way. Scale $\frac{1}{60}$.

5. Explain how the ditch might be crossed in the case described in Question 4, supposing the defenders to have the power of emptying the ditch and filling it again at pleasure.

6. Give a sketch of the trace of a front of fortification, with counterguards in front of both bastions and ravelins. Explain the defects of this construction, and mention the applications of counterguards which are admissible.

7. Give a hand sketch showing the trace of a front of the modern French system. Explain the advantages of the trace of the ravelin and redoubt over Vauban's construction.

8. What are the peculiar features of the German or polygonal system of fortification, and what are the advantages claimed for this system over the French bastioned system?

9. Give an estimate of the men, tools, and materials required for sinking a shaft 15 feet deep and driving a gallery 40 feet long from its bottom in easy soil. Calculate the charge necessary to produce a 6-lined crater with a line of least resistance of 12 feet, and explain how the mine would be loaded, and fired without the aid of electricity. What would be the probable "radius of rupture?" Explain the meaning of this expression.

Military Surveying.

Lieut.-Colonel Scott, R.E.

Maximum of Marks - - 1,200
Minimum „ - - 300

No of Marks obtained.	No. of Candidates.
0 - 300	23
300 - 400	17
400 - 500	18
500 - 600	22
600 - 700	18
700 - 800	13
800 - 900	9
900 - 1,000	3
1,000 - 1,100	1
1,100 - 1,200	1
Total -	125

App. XIV.

Royal Military College.

Military History.

Captain J. P. Battersby.

Maximum of Marks - - 1,200
Minimum „ - - 300

No. of Marks obtained.	No. of Candidates.
0 - 300	21
300 - 400	26
400 - 500	33
500 - 600	17
600 - 700	15
700 - 800	7
800 - 900	3
900 - 1,000	2
1,000 - 1,100	0
1,100 - 1,200	1
Total -	125

N.B.—Candidates should bear in mind that concise, clear, and intelligent answers to the questions will be considered of more value than a lengthy narrative, as the questions have been framed with a view to test the apprehension, rather than to tax the memory.

1800.

1. Make a rough pen-and-ink sketch of the Rhine from Mayence to Lake Constance, and of the Danube from its source to Ulm, marking the main lines of communication between the valleys of the two rivers, through the Black Forest, and the position of the following places—Strasburg, Bâle, Engen, Brisach, Fribourg, Stokach, Schaffhausen, Ulm, Donau-Eschingen, Mösskirch, Sigmaringen, and Biberach.

2. State, in general terms, the plan proposed by Napoleon for the passage of the Rhine. How did it differ from that pursued by Moreau, and what were the relative merits of each?

3. What error did Moreau commit in the disposal of his forces about Ulm between the 12th and 15th May, and how was this exemplified by subsequent events?

Campaign of Hohenlinden.

4. What were the duties assigned to the corps of Macdonald, Augereau, and Murat in this campaign?

5. What were the Archduke John's arrangements for advancing from the Inn for the purpose of falling on the French left at Hohenlinden; and what do you consider was faulty in them?

6. Describe the position of the French army on the eve of the battle of Hohenlinden; Moreau's plans for meeting the Austrian attack; with the manner of making and the result of the decisive movement during the battle.

1805.

7. With how many attacks, and from what points, was France threatened in the summer of 1805; and how did Napoleon propose to meet and repel them?

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8. Where did Napoleon form his depôts in his advance upon Vienna from Ulm?

9. Describe the position of St. Polten, and the arrangements made by Napoleon for guarding his flanks against the probable attacks from the Archduke Charles and Prince Ferdinand in his advance upon Vienna.

10. Describe briefly Napoleon's disposition of his forces on the position in front of Brünn; his reasons for such a distribution; and the manner in which he proposed to pass from the defensive to the offensive during the battle.

1806.

11. What was Napoleon's line of operations in advancing from the valley of

the Rhine into Saxony? Mention any others that he might have chosen, and the motives which influenced his choice.

12. What measures did Napoleon take to bar the passage of the Saal to the Prussian army, with a view to cutting them off from the Elbe?

13. Describe the Duke of Brunswick's plans for conducting the retreat of the Prussian army from Weimar to the Elbe. In carrying them out, what grave error did he commit on the eve of the battle of Auerstedt?

1815.

14. Why did the Duke of Wellington at first anticipate that the French attack would be made against the right instead of the centre or left of the allied front in Belgium; and what provision did he make to meet it, should it be made between the Scheldt and Lys?

15. With what strategical object did Ney attack the Anglo-Belgian army at Quatre-Bras? and to what would you mainly attribute his want of success?

16. What errors does it appear that Napoleon and Grouchy fell into between the evenings of the 16th and 18th of June? and what was the effect of those errors upon the struggle at Waterloo?

17. What are the chief requirements for a good defensive-offensive position? and how far were these fulfilled in that of the Anglo-Belgian army at Waterloo?

18. Describe briefly Napoleon's last grand attack with two columns of the Imperial Guard at Waterloo, and the way in which it was met and repulsed. What was taking place on the French right at this time?

Blenheim.

19. In what manner did the Gallo-Bavarian army occupy the position of Blenheim, and how did their defective dispositions contribute materially to their defeat?

General History.

20. What was Napoleon's chief object in forming the Confederation of the Rhine? Name the principal states included in it?

21. Define the geographical position of Aboukir. What led to the naval battle there in 1798? and how did the result of it affect the position of the French army in Egypt?

22. Name the European powers which formed the Quadruple Alliance; the object of its formation; and how this object was to be attained.

FRENCH.—M. SAVOYE.

Maximum of Marks - - 1,200
Minimum „ - - 300

No. of Marks obtained on this and the following Paper.	No. of Candidates.
0 - 300	24
300 - 400	15
400 - 500	26
500 - 600	14
600 - 700	13
700 - 800	21
800 - 900	8
900 - 1,000	1
1,000 - 1,100	2
1,100 - 1,200	1
Total -	125

I.

Traduisez en anglais :—

Le désespoir m'allait saisir: on pense à moi pour une place; mais par malheur j'y étais propre: il fallait un calculateur, ce fut un danseur qui

App. XIV.
Royal Military College.

l'obtint. Il ne me restait plus qu'à voler; je me fais banquier de pharaon: alors, bonnes gens! je soupe en ville, et les personnes dites *comme il faut* m'ouvrent poliment leur maison en retenant pour elles les trois quarts du profit. J'aurais bien pu me remonter; je commençais même à comprendre que, pour gagner du bien, le savoir-faire vaut mieux que le savoir. Mais comme chacun pillait autour de moi, en exigeant que je fusse honnête, il fallut bien périr encore. Pour le coup je quittai le monde; et vingt brasses d'eau m'en allaient séparer lorsqu'un dieu bienfaisant m'appelle à mon premier état. Je reprends ma trousse et mon cuir anglais; puis, laissant la fumée aux sots qui s'en nourrissent . . . . je vais rasant de ville en ville, et je vis enfin sans souci.—BEAUMARCHAIS.

II.

Questions Grammaticales.

1. Ecrivez l'infinitif présent et passé, les deux participes, la première personne du singulier et du pluriel de l'indicatif présent, la première personne singulière de l'imparfait, du prétérit (passé défini), du futur et du conditionnel simples, du présent et de l'imparfait du subjonctif, ainsi que l'impératif, au singulier et au pluriel, des verbes *obtint* et *vaut*.

Dites lesquelles de ces différentes parties de verbe sont *primitives*, ou bien *dérivées;* indiquez si ces dernières sont formées régulièrement, ou irrégulièrement, en vous appuyant sur les règles de dérivation que vous détaillerez.

2. "Il *fallait* un calculateur, ce *fut* un danseur qui *obtint* la place." Expliquez la règle sur l'emploi de l'*imparfait*, du *passé défini* et du *passé indéfini* en français, et citez des exemples à l'appui de vos réponses.

3. "En exigeant que je *fusse* honnête." Quelle est la règle de l'emploi du subjonctif en français, et quand faut-il mettre le présent, quand le passé du subjonctif? Donnez des exemples.

4. La phrase interrogative française se forme-t-elle de la même manière que la phrase interrogative anglaise? Quelles ressemblances ou quelles différences remarquez-vous entre les deux langues? Citez, à l'appui de vos réponses, des exemples des diverses phrases interrogatives que vous connaissez: phrases affirmatives, phrases négatives; avec un substantif ou avec un pronom personnel pour sujet.

III.

Write a short letter in French to an old schoolfellow of yours; give him an account of your feelings on the eve of your either quitting Sandhurst for ever, or your having to remain there for another year, according to the good or bad result of your examinations, and tell him what you purpose doing for the next three months if everything goes well.

N.B.—Mind the heading (date and allocution) and the concluding form of a letter in French.

IV.

Translate into French:—

The general, as I told you this morning, took the town by assault, put the garrison to the sword, but forbade that any harm should be done to the inhabitants. However brave our enemies proved to be, they were unable to resist so fierce an attack. As for our friend, whose death is lamented by every one, he was charging at the head of his company, when a bullet came and struck him.

Hast thou a father? asked the Indian of the young man. My father was alive when I left my country. Alas, how wretched must be be! Dost thou know that I have been a father? I am a father no more. I saw my son fall in battle. He fought at my side. I saw him expire. He was covered with wounds when he fell dead at my feet.

French.—M. Esquiros.

I.

Traduisez en anglais :—

Bataille de Balaclava.

En face d'une cavalerie russe plus nombreuse au moins trois fois que la sienne, le Major-général Scarlett n'hésite pas à lancer en avant la petite troupe des Ecossais-gris et des dragons d'Enniskillen. Il y eut alors un de ces combats émouvants, tels que l'imagination se les représente sans pouvoir les dépeindre. Nous étions accourus de nombreux Français sur les hauteurs qui dominaient le théâtre de l'action. A travers la poussière soulevée par les pieds des chevaux et la fumée non moins épaisse de la foudre, on voyait briller l'acier des sabres qui réflétaient la vive lumière du soleil. Alors les cohortes grises et les cohortes rouges des Anglais étaient vues traversant les masses foncées de Russes. On avançait, on reculait, on se traversait avec une impétuosité sans exemple, pendant que les spectateurs levaient les mains au ciel, et puis regardaient les mouvements avec inquiétude, et de temps en temps, soutenaient l'ardeur des généreux Anglais par des bravos enthousiastes. Cependant la mousqueterie des Highlanders avait mis en déroute les bataillons ennemis qui les menaçaient.—De Damas.

II.

Questions grammaticales.

1. Comment les substantifs qui se terminent en *al* forment-ils leur pluriel ? Citez, s'il y a lieu, des exceptions à la règle que vous indiquerez.
2. Ecrivez le masculin et le feminin des adjectifs français correspondant aux mots anglais, *Turkish, Hebrew, long, fresh, white, dry, foolish, fat.*
3. Quels sont le participe présent, le participe passé, le présent de l'indicatif et le passé défini de *couvrir, moudre,* et *souffrir ?*
4. Comment traduisez-vous en français les pronoms possessifs, *mine, thine,* quand ils se trouvent liés dans une phrase anglaise à *to be,* ayant la signification de *to belong ?* Donnes quelques exemples.

III.

Ecrivez en francais une lettre d'une demi page pour demander au gouverneur de l'Hôtel des Invalides, à Paris, la permission de visiter cet hospice militaire.

IV.

Traduisez en français :—

A delicate constitution seemed to unfit Turenne for the military life he so much admired. Campaigns are rough winnowers of weakly habits, and his parents discouraged his ardour for the field. To alter their opinion, the enthusiastic lad, at the age of ten, resolved to spend a winter night upon the ramparts of Sedan. His governor, the Chevalier de Vassignac, sought him a long time in vain, and found him at last asleep on the carriage of a cannon.—Cockaine.

German.—Rev. B. Schöll, Ph. Dr.

Maximum of Marks - 1,200
Minimum ,, - 300

No. of Marks obtained.	No of Candidates.
0 - 300	5
300 - 400	8
400 - 500	7
500 - 600	6
600 - 700	5
700 - 800	3
800 - 900	3
900 - 1,000	4
1,000 - 1,100	1
Total	42

App. XIV.

Royal Military College.

I.

Grammatical questions.

1. Decline the indefinite article.

2. Decline der große Hund.

3. Give the meaning, the gender, and the nominative plural of Jahr, Bucht Nelke, Knabe, Stachel, Haus, and Maus.

4 Write the cardinal numbers from 20 to 30.

5. Give in full the conjugation of the verb wollen.

6. Give the first person of the present and imperfect indicative, as well as the past participle of the verbs befehlen, beginnen, biegen, binden, bitten, brechen.

II.

Translate into English :—

Drei Freunde hat der Mensch in dieser Welt; wie betragen sie sich in der Stunde des Todes, wenn ihn Gott vor Gericht fordert? Das Geld, sein bester Freund, verläßet ihn zuerst und geht nicht mit ihm. Seine Verwandten und Freunde begleiten ihn bis zur Thur des Grabes und kehren wieder in ihre Häuser. Der dritte, den er im Leben oft am meisten vergaß, sind seine wohlthätigen Werke. Sie allein begleiten ihn bis zum Throne des Richters; sie gehen voran, sprechen für ihn und finden Barmherzigkeit und Gnade.

III.

Translate into German :—

I spoke of him who stands at the door. I come with the same request. The chair on which I am sitting is too high. Charity, the practice of which is our duty, makes us happy. Do not forget the subjects on which I have spoken to you. I know what has happened. Our master has been obliged to punish two boys. I ought to have written to my sister. He will be able to do it to-morrow. My neighbour is said to be rich. It may be; but we must not believe all that people say.

IV.

Those who are more advanced will, in addition to the above, translate the following passages :—

1. Into German :—

The conquest of England by William the Norman was commenced rather than achieved by the battle of Hastings; as the repeated outbreaks of the sturdy Saxons in all parts of the kingdom, which occupied the first twenty years of his reign, necessitated constant vigilance and the frequent presence of an overawing force. In 1085 the threat of a Danish invasion, invited by the Saxon rebels, summoned him in haste from Normandy.

2. Into English :—

Die Sonne neigte sich eben zum Untergang, indem beide Schlachtordnungen auf einander treffen. Heftiger erhitzt sich der Streit an seinem Ende, die letzte Kraft ringt mit der letzten Kraft, Geschicklichkeit und Wuth thun ihr Aeußerstes, in den letzten theuren Minuten den ganzen verlornen Tag nachzuholen. Umsonst, die Verzweiflung erhebt jede über sich selbst, keine versteht zu siegen, keine zu weichen. Endlich setzen Nebel und Nacht dem Gefecht eine Grenze, dem die Wuth keine setzen will, und der Angriff hört auf, weil man seinen Feind nicht mehr findet.

Experimental Science.—Professor Liveing.

Maximum of Marks - 1,200
Minimum „ - 300

No. of Marks obtained.	No. of Candidates.
0 - 300	45
300 - 400	12
400 - 500	10
500 - 600	5
600 - 700	5
700 - 800	7
800 - 900	2
900 - 1,000	1
1,000 - 1,100	0
1,100 - 1,200	0
Total	87

1. Point out the difference between *gas*, *vapour*, and *liquid*. Name one or more substances which, though gases under ordinary circumstances, may be brought to the liquid or solid state; and state the means by which such a change is effected.

2. Explain what is meant when it is said that gases press equally in all directions. Also describe and explain the condensing air-pump.

3. State the constitution of the atmosphere. Explain the causes which would lead us to suppose that the air of a large city would differ from that of the country; and how it comes to pass that the difference observed is so small.

4. Explain the principle of the rise of a balloon. What gas is usually employed for filling balloons, and why is it preferred to hydrogen?

5. Show that a common barometer gives a measure of the *pressure* of the air at the time and place of observation; and explain why a correction for temperature has to be applied.

6. Enunciate in exact terms the ordinary law of dilatation of solids for changes of temperature. What is peculiar about the expansion of water? Describe some experiment by which this peculiarity may be shown.

7. Find the temperatures corresponding to 60° C. and and 32° R. in Fahrenheit's scale.

8. Describe some experiments in proof of the fact that heat disappears when a solid is converted into a liquid. Can you account for the rise of temperature when sulphuric acid and water are mixed?

9. Explain the difference between saturated and unsaturated vapour; also why a closed vessel which contains steam only may be heated, without danger of bursting, to a much higher temperature than if it contained water as well as steam.

10. If you had to construct a fire-proof safe to protect papers, what materials would you use, and what principles would guide you in selecting them?

11. Define an element and a compound in chemistry. How is it made out that oxygen is the most abundant element in nature? Give examples of neutral, acid, and basic oxides respectively.

12. Describe and explain the preparation of hydrogen. When a lighted candle is put into a jar of hydrogen, explain why the hydrogen burns but the candle goes out.

13. State the composition of water by weight and by volume; and describe Cavendish's experiment showing the composition of water synthetically. Explain the cause of the explosion.

14. Describe and explain the preparation of chlorine. Give an account of the most striking properties of that element.

15. A certain quantity of air occupies 67 cubic inches when the temperature is 10° C., and the barometer at 28 inches. How many cubic inches will it occupy at 0° C., with the barometer at 30 inches, taking the coefficient of cubical expansion at $\frac{1}{267}$ for 1° C.?

GEOLOGY, AND MINERALOGY.—WARINGTON SMYTH, M.A., F.R.S.

Maximum of Marks - 1,200
Minimum „ - 300

No. of Marks obtained.	No. of Candidates.
0 - 300	32
300 - 400	26
400 - 500	23
500 - 600	7
600 - 700	3
700 - 800	4
800 - 900	1
900 - 1,000	0
1,000 - 1,110	0
1,110 - 1,200	0
Total	96

1. Give a definition showing how a mineral differs from a rock substance.

2. State the diameter and mean density of the earth, and describe the method of determining the latter.

3. Draw up a report on the geological structure of the Bagshot district.

4. Of what nature are the rocks termed *conglomerates?* how have they been formed? and to what uses are they applicable?

5. Explain what is meant by *outliers* or *outlying* strata, and their bearing upon views of the former extension of certain deposits.

6. Describe the phenomena termed *faults*, and give an example of the importance of studying them.

7. What are the most generally received explanations of the formation of valleys?

8. Describe the process of the destruction of limestone rock by the agency of water.

9. Mention the constituents of granite, and of basaltic lava, respectively.

10. Draw up a Table showing the regular succession of the secondary strata, and stating what substances of practical use are found in each.

11. Name the subdivisions of the tertiary strata, and the districts in Europe in which they are best exhibited.

12. Give a sketch drawing of a simple and of a compound form of crystal, in each of the following systems of crystallization, the cubical, the pyramidal or tetragonal, and the hexagonal.

13. Trace the changes by which the mineral felspar is decomposed, and forms clay.

14. State the names and specific gravity of the three heaviest metals or natural alloys.

15. Mention two examples of binary and two of ternary compounds among minerals, giving their composition.

16. How is the comparative hardness of minerals employed in their discrimination, and in what manner is it best determined?

LANDSCAPE DRAWING.—Rev. W. KINGSLEY, B.D.

Maximum of Marks - 600
Minimum „ - 150

Marks gained.	No. of Candidates.
0 - 150	1
150 - 200	3
200 - 300	34
300 - 400	20
400 - 500	10
500 - 600	7
Total	75

APPENDIX XV.

EXTRACT from GENERAL ORDER 754, dated Horse Guards, 15th June 1860.

Previously to appointment as probationary deputy-assistant commissary generals, candidates will be required to undergo an examination according to the following scheme, viz. :—

Obligatory.

		Maximum of Marks.
English language	Correct writing from dictation Composition	1,000
Arithmetic	First four rules, simple and compound, weights and measures, vulgar and decimal fractions, duodecimals, proportion, extraction of square root, practice, and interest and discount	1,000
One foreign language		1,000

In each of the subjects, one-half of the marks allotted to it should be gained for qualification.

Voluntary Subjects.

Mathematics	Commercial arithmetic: Book-keeping and exchange accounts Algebra Euclid—Books 1 to 6, and 11 and 12 Trigonometry Mensuration of planes and solids Mechanics	2,500
Geography	Especially in reference to the population, commercial production, resources, and communications of countries	1,000
History—from the year 1789		1,000
Chemistry		1,000
Geology and Mineralogy		1,000
Any other modern language, each		1,000

No candidate will be considered qualified who does not obtain an aggregate of 2,400 marks. Not more than three of the voluntary subjects must be taken up by any candidate,—nor will he be allowed to count the marks he obtains in any voluntary subject, if below one-fifth of the maximum allotted to it.

App. XV.
Commissariat.

Examination of Candidates for the Commissariat.

Voluntary Mathematics.—Rev. Canon Heaviside, M.A.

1. Explain briefly the principle of keeping accounts by "double entry." Give some description of a "waste book," "journal," and "ledger."

Rule a cash book and enter in it the following transactions, and strike a balance:

1864.		£	s.	d.
Jan. 1.	Cash in hand	501	10	11
	Cash at bankers	1,602	0	1
,, 3.	Paid John Evans (by cheque)	204	3	2
,, 4.	Paid into bank	400	0	0
,, 5.	Paid John Smith	12	13	4
,, 6.	Received of Evan Jones	100	10	6
,, 9.	John Woornan's draft on me due this day, paid by Barber	400	0	0
,, 10.	Received of William Charles	25	7	6
,, 11.	Paid to my account at bank by John Evans	168	12	6

2. A person sells 3 per cent. consols at 96, and invests the money in railway shares which pay 5 per cent., his income is thus increased by 50 per cent., find the price per cent. at which he purchased the railway shares.

3. What is meant by the course of exchange between two countries sometimes being "above par," and sometimes "below par."?

Reduce 2588 francs 19 cents, French currency, to English, the course of exchange being 25 francs 30 cents for one pound sterling.

4. Find the par of exchange between England and France by comparing the silver coinage of the two countries from the following data:

English standard silver $(\frac{37}{40})^{\text{th}}$ fine is at 5*s.* $1\frac{3}{8}$*d.* per ounce; 1 kilogramme of French standard silver $\frac{9}{10}$ fine is coined into 200 francs, the weight of the killogramme being 15,432 grains Troy.

5. Find by the aid of the logarithmic tables,—

(1) $(\cdot 000724)^{\frac{1}{3}}$.

(2) The 9th term of the series

$$1+\frac{22}{23}+\left(\frac{22}{23}\right)^2+\left(\frac{22}{23}\right)^3+\text{\&c.}$$

6. Find the greatest common measure of

$$9x^3+53x^2-9x-18 \text{ and } x^2+11x+30$$

7. Solve the following equations

(1) $$\frac{10}{x}-\frac{3}{x+2}=\frac{10}{x=1}.$$

(2) $$\left.\begin{aligned}\frac{(x+y)^2}{a^2}+\frac{(x-y)^2}{b^2}&=8\\ xy&=a^2-b^2\end{aligned}\right\}$$

8. Distinguish between "combinations" and "permutations."

Show that the number of combinations of 10 things taken 7 at a time, is the same as the number of combinations of 10 things taken 3 at a time.

9. Expand $(x+a)^6$ by the binomial theorem.

Geography.—G. W. Dasent, D.C.L.

1. Enumerate the chief colonial possessions of Great Britain, and state how and when each of them was acquired.

2. Name the principal seaports of Great Britain and Ireland, and give some particulars as to the physical position, population, and commerce of each.

3. What metals and what minerals have most influence on the commercial prosperity and political development of a nation? Illustrate your answer by examples drawn from history.

4. Explain the meaning of the following geographical terms :—"watershed," "delta," "plateau," "sound," "archipelago," "basin," "promontory," "isthmus," and "gulf." Illustrate your answer by examples.

5. Mark on the map of England the position of London, Liverpool, Bristol, Portsmouth, Plymouth, Holyhead, Swansea, Newcastle-upon-Tyne, Hull, Manchester, Norwich, York, and Leeds.

6. In what countries are the following places situated, and for what events are they famous :—Algiers, Afghanistan, Aden, Alexandria, Copenhagen, Delhi, Herat, Kars, Bomarsund, Bunker's Hill, Kertch, Yorktown, Gibraltar, Malta, Tangiers, Tien-tsin, and Trafalgar.

7. Describe the physical features, commercial products, and political constitution of the Australian colonies of Great Britain.

8. In what direction has the stream of civilization and empire flowed throughout the history of the world? Has the physical conformation of the globe exerted any influence in giving that stream such a direction?

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